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ABSTRACT

This report presents findings from the second national survey of distance education undertaken by the National Center for Education Statistics. The survey covers the 12-month 1997-98 academic year and includes data for higher education institutions as well as all 2-year and 4-year postsecondary institutions. Highlights of the report include the following: distance education is becoming an increasingly visible feature of postsecondary education, primarily at public institutions, with an estimated 54,470 different courses offered; 8 percent of all 2-year and 4-year institutions offer degree or certificate programs designed to be completed totally through distance education; most institutions offering distance education use several types of video and Internet-based technologies; about three-quarters of institutions offering distance education charge the same tuition for these courses as for comparable on-campus courses; and between fall 1995 and 1997-98 the percentage of higher education institutions offering distance education courses increased from 33 to 44 percent. The first chapter of the report is an overview; following chapters review institutions and enrollments, course offerings and enrollments, degree and certificate programs, distance education technologies, tuition and fees, changes in distance education since 1994-95, and present conclusions. Appended are survey methodology, tables of standard errors, and the survey questionnaire. (CH)

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NATIONAL CENTER FOR EDUCATION STATISTICS

Report

December 1999

Distance Education at Postsecondary Education Institutions: 1997-98

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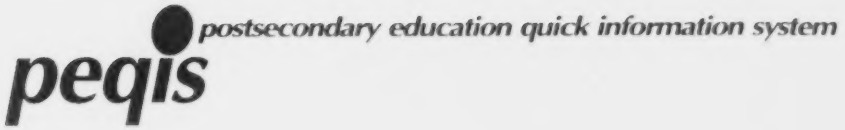
Statistical Analysis Report December 1999

Distance Education at Postsecondary Education Institutions: 1997-98



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EXECUTIVE SUMMARY

Many see the rise in the availability of technology-supported distance education—that is, the delivery of instruction over a distance to individuals located in one or more venues—not only as a revolutionary opportunity to increase access to postsecondary education, but also as an opportunity to hasten the overall pace of reform in higher education (Ehrmann n.d.). In contrast to the institutional status quo, what was once an eclectic assortment of individually accessed, noncredit educational courses is quickly being knit into comprehensive degree- and certificate-granting programs (Phipps, Wellman, and Merisotis 1998). Indeed, if a recent article in *The Chronicle of Higher Education* (April 9, 1999, A27) is any indication, the distance education industry is thriving: "For an industry that barely existed three years ago, the level of activity is dizzying."

This report presents findings from the second nationally representative survey of distance education undertaken by the National Center for Education Statistics (NCES). This survey was conducted in winter 1998–99, and collected information about the 12-month 1997–98 academic year. The first report, *Distance Education in Higher Education Institutions* (U.S. Department of Education 1997) was based on data from a 1995 NCES Postsecondary Education Quick Information System (PEQIS) survey of higher education institutions. The current report updates and expands upon the findings from the previous report in several important ways. Perhaps most significantly, the current survey expands the universe of institutions from which it collected data, from higher education institutions to all 2-year and 4-year postsecondary institutions. In addition, this report also presents new information about fields of study and instructional levels of courses and programs offered through distance education, as well as information about how tuition and fees charged for distance education courses compare to those charged for on-campus courses. Finally, this report also provides trend information for higher education institutions, including changes in the percentage of higher education institutions offering distance education courses, enrollments and course offerings, degree and certificate programs, as well as technologies used to deliver distance education courses.

Key Findings

Institutions and Enrollments

Evidence suggests that distance education is becoming an increasingly visible feature of postsecondary education in this country. This report provides descriptive information about all 2-year and 4-year postsecondary education institutions that offered distance education in 1997–98, including enrollments in distance education courses at those institutions. Analyses of institutions and enrollments are presented by institutional type and size. Information is also included about enrollments by the level of course offerings (undergraduate or graduate/first-professional). Results of the 1997–98 PEQIS survey indicate that:

- About one-third of the nation's 2-year and 4-year postsecondary education institutions offered any distance education courses during the 12-month 1997–98 academic year, and another one-fifth of the institutions planned to start offering such courses within the next 3 years. About half of the postsecondary institutions did not offer and did not plan to offer distance education courses in the next 3 years (table 2).
- Distance education was more likely to be conducted by public institutions; 78 percent of public 4-year institutions and 62 percent of public 2-year institutions offered distance education courses, compared with 19 percent of private 4-year and 5 percent of private 2-

year institutions. Distance education was also strongly related to institutional size; distance education courses were more likely to be offered by medium and large institutions than by small institutions (table 2).

- There were an estimated 1,661,100 enrollments[1] in all distance education courses, and 1,363,670 enrollments in college-level, credit-granting distance education courses, with most of these at the undergraduate level (table 5). About half of the institutions that reported offering distance education courses in 1997–98 reported 300 or fewer enrollments in those courses (figure 1).

Course Offerings

Comprehensive information about the courses available through distance education and enrollments in those courses has not been widely available. To address this gap in the knowledge base, this report provides information about total courses and college-level, credit-granting courses offered through distance education by all postsecondary institutions. Analyses of course offerings are presented by institutional type, general field of study, and instructional level of the course (undergraduate or graduate/first-professional). According to the 1997–98 PEQIS survey:

- An estimated 54,470 different distance education courses[2] were offered, most of which were college-level, credit-granting courses (49,690) (table 6). About half of the institutions that offered distance education courses in 1997–98 offered 15 or fewer different distance education courses, with 23 percent offering 1 to 5 courses (figure 2). Public 2-year and 4-year institutions combined offered about 8 out of 10 of the distance education courses offered (table 6).
- The two fields in which more institutions that offered distance education courses offered college-level, credit-granting distance education courses were the general field of English, humanities, and the social and behavioral sciences (70 percent of institutions) and the field of business and management (55 percent of institutions) (table 7).
- The general pattern was for institutions to offer for-credit distance education courses more at the undergraduate than at the graduate/first-professional level. The exceptions were in the fields of education, engineering, and library and information sciences, where more college-level, credit-granting distance education courses were offered at the graduate/first-professional level than at the undergraduate level (table 7).

Degree and Certificate Programs

While taking individual courses through distance education has the potential to increase access to postsecondary education among those who traditionally have not had access, it is the possibility of completing degree and certificate programs solely through distance education that offers the potential for the most dramatic changes in access and opportunity. This report presents information about the prevalence of distance education degree and certificate programs in all postsecondary institutions by institutional type, level of the degree and certificate programs, and general field of study. The 1997–98 PEQIS survey indicates that:

- Eight percent of all 2-year and 4-year postsecondary institutions offered college-level degree or certificate programs that were designed to be completed totally through distance education. Among the 34 percent of institutions that offered any distance education courses in 1997–98, 25 percent offered distance education degrees or certificates. Among all postsecondary institutions, public 4-year institutions were more likely than other types of institutions to

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[1] If a student was enrolled in multiple courses, institutions were instructed to count the student for each course in which he or she was enrolled. Thus, enrollments may include duplicated counts of students.

[2] If a course had multiple sections or was offered multiple times during the academic year, institutions were instructed to count it as only one course.

offer distance education degree and certificate programs (table 13).

- In 1997–98, 2-year and 4-year postsecondary institutions offered an estimated 1,230 distance education degree programs and 340 distance education certificate programs (table 15). Postsecondary institutions offering distance education programs were more likely to offer graduate/first-professional degrees or certificates than undergraduate degrees or certificates (table 15). Graduate/first-professional degree programs were most likely to be offered in business and management, the health professions, education, and engineering (table 14).

Distance Education Technologies Employed

Changes in the types of technologies available for delivering distance education, including changes in the capabilities of networking technology and the rise of the Internet, have played a role in the adoption of distance education by postsecondary institutions. This report provides information about the types of technologies employed by all postsecondary institutions to deliver distance education in 1997–98. To provide insight into the dynamic nature of distance education technologies, the report also includes information about institutions' plans for the use of different technologies in the next 3 years. According to the 1997–98 PEQIS survey:

- While postsecondary education institutions employed a wide variety of distance education technologies during 1997–98, more institutions that offered distance education courses were likely to use several types of video technologies and the Internet-based technologies than any other modes of delivery included in the survey. Specifically, asynchronous Internet instruction, two-way interactive video, and one-way prerecorded video were used by more institutions than any other distance education technologies (table 17).
- Two-way interactive video was more likely to be used by public 4-year institutions (80 percent) than by any other type of institution, and by public 2-year institutions (53 percent) more than private 4-year institutions (29 percent). One-way prerecorded video was more likely to be used by public 2-year institutions (62 percent) than by either public or private 4-year institutions, and by public 4-year institutions (44 percent) more often than by private 4-year institutions (26 percent). The Internet technologies, however, were generally about equally likely to be used by the various types of institutions, ranging from 16 percent to 22 percent for synchronous Internet instruction, and from 57 percent to 61 percent for asynchronous Internet instruction (table 17).
- Institutions that offered distance education in 1997–98 or that planned to offer distance education in the next 3 years reported that they planned to start using or increase their use of Internet-based technologies and two-way interactive video in the next 3 years more than any other types of technologies. This suggests that Internet and interactive video technologies will be a growing mode of delivery among postsecondary institutions (table 18).

Tuition and Fees

While distance education can be seen as a cost savings approach to providing postsecondary education, the costs in developing, implementing, and delivering distance education courses can also be substantial. One might expect that institutions might pass these costs or cost savings on by charging different tuition and fees to students enrolled in distance education courses. To examine this issue, this report provides information about how tuition and fees for distance education courses compare to those for traditional campus-based courses. Analyses are presented by institutional type. Findings from the 1997–98 PEQIS survey indicate that:

- About three-quarters of institutions that offered any distance education courses in 1997–98 charged the same tuition for these courses as for comparable on-campus courses. Public 2-year institutions were more

likely than public or private 4-year institutions to indicate that tuition charges were always the same for distance education and on-campus courses, with 90 percent of public 2-year institutions giving this response (table 20).

- Two-thirds of institutions offering distance education courses in 1997–98 reported that they did not add special fees to their college-level, credit-granting distance education courses that were not added to on-campus courses (figure 4).
- Overall, 57 percent of institutions are charging both comparable tuition and comparable fees for distance education and on-campus courses.

Changes in Distance Education Since 1994–95

While this report primarily presents findings on various aspects of distance education for all postsecondary institutions for 1997–98, an analysis of the data for the subset of higher education institutions allows trend comparisons with the previous NCES report on distance education. Changes in distance education since 1994–95[3] are presented in this report in terms of the percentage of institutions offering distance education courses, the number of distance education courses offered, the number of enrollments in distance education courses, the availability of distance education degree and certificate programs, and the technologies used to deliver distance education courses. Findings indicate that:

- Between fall 1995 and 1997–98, the percentage of higher education institutions offering distance education courses increased by about one-third, from 33 percent to 44 percent (table 21). From 1994–95 to 1997–98, the number of course offerings and enrollments in distance education approximately doubled (tables 22 and 23). And, although the percentages of institutions offering distance education degree and certificate programs were essentially the same in 1997–98 as in 1995, the number of degree and certificate programs that were offered nearly doubled (table 24). Taken together, these findings suggest that the expansion in distance education appears to be among institutions that have offered distance education for the past 3 years. These institutions have substantially increased the number of distance education courses, enrollments, and degree and certificate programs that they offer.
- Among all higher education institutions offering any distance education, the percentages of institutions using two-way interactive video and one-way prerecorded video were essentially the same in 1997–98 as in 1995. The percentage of institutions using asynchronous Internet-based technologies, however, nearly tripled, from 22 percent of institutions in 1995 to 60 percent of institutions in 1997–98 (table 25)[4].

Conclusions

This PEQIS report presents findings for the 12-month 1997–98 academic year about the status of distance education in all postsecondary education institutions. It also includes an analysis of trends in distance education since 1994–95 for the subset of higher education institutions. In the most general terms, it finds that distance education appears to have become a common feature of many postsecondary education institutions and that, by their own accounts, it will become only more common in the future.

While findings from this report will help to inform stakeholders—including individuals considering a postsecondary education, faculty

[3] The first PEQIS study, conducted in fall 1995, sometimes asked for information about the current time frame (i.e., fall 1995), and sometimes asked for information about academic year 1994–95. Thus, both dates appear in the discussion of the results.

[4] In 1997–98, the wording of the computer-based technologies was changed to more accurately reflect how these technologies are used. For this comparison, other computer-based technology (e.g., Internet) is considered to be approximately equivalent to Internet courses using asynchronous computer-based instruction.

and administrators at postsecondary institutions, providers of technologies used for distance education, and policymakers at federal, state, and local levels—they do not address many of the questions about distance education. These questions include issues related to:

- equity of access to postsecondary education,
- the costs of developing and implementing distance education programs,
- accreditation of and quality assurance in distance education programs,
- copyright and intellectual property rights,
- changes and challenges facing the role of postsecondary faculty, and
- pressures on existing organizational structures and arrangements.

It is a dynamic time for postsecondary education institutions facing the opportunities and challenges brought by technological innovation. As Gladieux and Swail (1999) assert: given the fact that computer and related technologies are evolving so quickly—and new providers and brokers of higher education proliferating so rapidly—no one knows how traditional higher education will change.

Table of Contents

Chapter		Page
	Executive Summary	iii
1	Introduction	1
	Overview	2
	What is Distance Education?	2
	Why Might Institutions Implement Distance Education?	2
	How is Distance Education Delivered?	3
	How is Distance Education Organized?	5
	How Effective is Distance Education?	6
	Emerging Policy Issues	7
	Organization of this Report	8
2	Institutions and Enrollments	11
	Institutions Included in This Study	11
	Institutions Offering Distance Education Courses	12
	Overall Enrollment in Distance Education Courses	15
	Summary	17
3	Course Offerings and Enrollments	19
	Number of Distance Education Courses Offered in 1997–98	19
	Course Offerings Included in the Study	22
	Course Offerings by Field of Study	23
	Enrollments by Field of Study	27
	Summary	29
4	Degree and Certificate Programs	31
	Institutions Offering Degree and Certificate Programs	31
	Number of Degree and Certificate Programs	34
	Summary	36
5	Distance Education Technologies	37
	Technologies Included in This Study	37
	Instruction Technologies Used in 1997–98	37
	Plans for Use of Instructional Technologies in the Next 3 Years	39
	Summary	41

Table of Contents (continued)

Chapter		Page
6	Tuition and Fees	43
	Tuition	43
	Fees	45
	Summary	46
7	Changes in Distance Education Since 1994–95	47
	Comparing the PEQIS Studies: An Overview	47
	Institutions Offering Distance Education Courses	47
	Number of Distance Education Courses Offered	49
	Enrollment in Distance Education Courses	50
	Degree and Certificate Programs	51
	Distance Education Technologies	52
	Summary	54
8	Conclusions	55
	References	57

List of Appendices

Appendix		
A:	Survey Methodology and Data Reliability	A-1
B:	Tables of Standard Errors	B-1
C:	Survey Questionnaire	C-1

List of Text Tables

Text Table		
1	Percentage distribution of 2-year and 4-year postsecondary education institutions in the nation, and the percentage distribution of students enrolled at those institutions, by institutional characteristics: 1997–98	12
2	Number and percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education courses in 1997–98, that planned to offer them in the next 3 years, and that did not offer and did not plan to offer them in the next 3 years, by institutional characteristics	12
3	Percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education courses in 1997–98, and the percentage distribution of students enrolled at those institutions, by institutional characteristics	13

Table of Contents (continued)

List of Text Tables

Text Table		Page
4	Total number of 2-year and 4-year postsecondary education institutions, and the number and percent of institutions in the nation that offered distance education courses in 1997–98, by level of institutional offerings	14
5	Total number of enrollments in all distance education courses, and the number of enrollments in college-level, credit-granting distance education courses offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics	16
6	Total number of different distance education courses, and the number of different college-level, credit-granting distance education courses offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics	20
7	Percent of 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that offered college-level, credit-granting distance education courses in various fields of study in 1997–98, by course level and field	23
8	Percent of all 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that offered college-level, credit-granting distance education courses in various fields of study in 1997–98, by institutional type and field	24
9	Number of different college-level, credit-granting distance education courses offered in various fields by 2-year and 4-year postsecondary education institutions in 1997–98, by course level and field	25
10	Number of different college-level, credit-granting distance education courses offered in various fields by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional type and field	26
11	Number of enrollments in college-level, credit-granting distance education courses offered in various fields at 2-year and 4-year postsecondary education institutions in 1997–98, by course level and field	27
12	Number of enrollments in college-level, credit-granting distance education courses offered in various fields at 2-year and 4-year postsecondary education institutions in 1997–98, by institutional type and field	28
13	Percent of all 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98, and the percent that had college-level degree or certificate programs designed to be completed totally through distance education in 1997–98, by institutional characteristics	32

Table of Contents (continued)

List of Text Tables

Text Table		Page
14	Percent of 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that had college-level degree or certificate programs in various fields that were designed to be completed totally through distance education, by level and field	33
15	Number of college-level degree and certificate programs designed to be completed totally through distance education offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics	34
16	Number of college-level degree programs in selected fields designed to be completed totally through distance education offered by 2-year and 4-year postsecondary education institutions in 1997–98, by level and field	35
17	Percent of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 indicating that the institution used various types of technology as a primary mode of instructional delivery for distance education courses in 1997–98, by institutional characteristics	38
18	Percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education in 1997–98 or that planned to offer distance education in the next 3 years according to their plans for the next 3 years concerning the number of distance education courses that will be offered, by type of technology that will be used as the primary mode of instructional delivery	39
19	Percent of 2-year and 4-year postsecondary education institutions offering distance education in 1997–98 or planning to offer distance education in the next 3 years that planned to start or increase their use of various types of technologies as the primary mode of instructional delivery during the next 3 years	40
20	Percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 according to how tuition charges for college-level, credit-granting courses offered through distance education compare to tuition charges for equivalent on-campus courses at their institution, by institutional characteristics	43
21	Percentage distribution of 2-year and 4-year higher education institutions according to current or planned offering of distance education courses, by institutional characteristics: Fall 1995 and 1997–98	48
22	Number of different distance education courses offered by 2-year and 4-year higher education institutions in 1994–95 and 1997–98, by institutional characteristics	49
23	Number of enrollments in 1994–95 and 1997–98 in distance education courses offered by 2-year and 4-year higher education institutions, by institutional characteristics	50

Table of Contents (continued)

List of Text Tables

Text Table		Page
24	Percent of 2-year and 4-year higher education institutions offering distance education courses that offered distance education degree and certificate programs, and the number of such programs in 1995 and 1997–98	51
25	Percent of 2-year and 4-year higher education institutions offering distance education courses that used various types of technologies to deliver distance education courses in 1995 and 1997–98	52
26	Percent of 2-year and 4-year higher education institutions offering distance education courses that used selected types of technologies to deliver distance education courses in 1995 and 1997–98, by institutional type	53

List of Figures

Figure		
1	Percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 according to number of enrollments in distance education courses	17
2	Percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 according to number of distance education courses	21
3	Percentage distribution of 2-year and 4-year postsecondary education institutions with variable charges for distance education courses compared with equivalent on-campus courses in 1997–98 indicating how those tuition charges for distance education courses differ	44
4	Percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 indicating whether the institution adds any special fees to college-level, credit-granting distance education courses that are not added to on-campus courses	45
5	Percentage distribution of 2-year and 4-year postsecondary education institutions with the same tuition for distance education and comparable on-campus courses in 1997–98 indicating whether the institution adds any special fees to college-level, credit-granting distance education courses that are not added to on-campus courses	45

List of Exhibits

Exhibit		
1	Generations of Distance Education Technologies	4

1. INTRODUCTION

> Management pundit Peter Drucker has predicted that the residential university campus as we know it will be defunct within 30 years. A better bet is that traditional higher education will change, not disappear. The question is: How will it change? The fact is, computer and related technologies are evolving so quickly—and new providers and brokers of higher education proliferating so rapidly—no one knows. (Gladieux and Swail 1999, 7)

Many see the rise in the availability of technology-supported distance education—that is, the delivery of instruction over a distance to individuals located in one or more venues—not only as a revolutionary opportunity to increase access to postsecondary education, but also as an opportunity to hasten the overall pace of reform in higher education (Ehrmann n.d.). In contrast to the institutional status quo, what was once an eclectic assortment of individually accessed, noncredit educational courses is quickly being knit into comprehensive degree- and certificate-granting programs (Phipps, Wellman, and Merisotis 1998). Indeed, if a recent article in the *Chronicle of Higher Education* (April 9, 1999, A27) is any indication, the distance education industry is thriving: "For an industry that barely existed three years ago, the level of activity is dizzying."

This report, conducted by the National Center for Education Statistics (NCES), presents findings from the second nationally representative survey of distance education at the postsecondary level. This survey, conducted in winter 1998–99, collected information about the 12-month 1997–98 academic year. The first report, *Distance Education in Higher Education Institutions* (U.S. Department of Education 1997) was based on data from a 1995 NCES Postsecondary Education Quick Information System (PEQIS) survey of higher education institutions. It reported findings on the number of institutions offering distance education courses, the number of distance education courses offered, enrollments in distance education courses, the number of distance education degree and certificate programs offered, and the types of technologies used to deliver distance education. As the first NCES report on the topic, it provided valuable baseline information about the status of distance education in higher education institutions.

The current report updates and expands upon the findings presented in the previous report in several important ways. Perhaps most significantly, the current survey expands the universe of institutions from which it collected data, from higher education institutions to all 2-year and 4-year postsecondary institutions. In addition, this report also presents new information about fields of study and instructional levels of courses and programs offered through distance education, as well as information about how tuition and fees charged for distance education courses compare to those charged for on-campus courses. Finally, this report also provides trend information for higher education institutions, including changes in the percentage of higher education institutions offering distance education courses, enrollments and course offerings, degree and certificate programs, as well as technologies used to deliver distance education courses. These empirical results are provided in the following chapters of this report. The remainder of this chapter provides a brief overview of issues related to distance education.

Overview

What is Distance Education?

Distance education in the most general sense of the term is instruction delivered over a distance to one or more individuals located in one or more venues (Phipps, Wellman, and Merisotis 1998). By this definition, the history of distance education can be traced back as far as the 1830s with the advent of commercial correspondence courses (Hanson et al. 1997). But the advent of advanced information technologies and, in particular, the Internet, has profoundly altered the character of distance education. Indeed, rapid changes in technology continue to challenge the traditional ways in which distance education is defined (Hanson et al. 1997)—resulting in the present situation where the term "distance education" is applied to a great variety of programs, providers, audiences, and media (Sherry 1996).

For the purposes of this study, distance education refers to education or training courses delivered to remote (off-campus) location(s) via audio, video (live or prerecorded), or computer technologies, including both synchronous and asynchronous instruction. Courses conducted exclusively on campus, as well as classes conducted exclusively via written correspondence, are not included in this definition of distance education (although some on-campus instruction or testing may be involved, and some instruction may be conducted via written correspondence). In addition, for the purposes of this study, distance education does not include courses in which the instructor travels to a remote site to deliver instruction in person, although courses may include a small amount of on-campus coursework or labwork, on-campus exams, or occasional on-campus meetings.

Why Might Institutions Implement Distance Education?

Several forces are at work in what some have characterized as the "current rush" to implement distance learning programs by colleges and universities, including the convergence of communication and computing technologies, the changing demographics of students pursuing postsecondary education, and the need to reduce the cost of education (Sherron and Boettcher 1997). It has been suggested that the primary benefits of implementing distance education programs for postsecondary institutions include the potential to increase enrollments of nontraditional students and to reduce program costs (Willis 1995). The 1995 PEQIS findings indicate, for example, that a large majority of institutions believed it somewhat or very important that their distance education offerings increase access to new audiences and increase enrollments. In addition, fewer institutions (but still a majority) reported that reducing institutional per-student costs was a somewhat or very important goal to their distance education program.

It has also been suggested that the benefits of implementing distance education programs also accrue to students. Accordingly, the primary benefit of distance education may be that it has the potential to provide access to postsecondary education where otherwise it might not have been available, due to such constraints as geography, time, job and family responsibilities, or finances (Sherron and Boettcher 1997). Increased access to certificate and degree programs via distance education may have the further benefit of encouraging students to undertake these programs or to complete them more quickly, particularly for part-time students (Turoff 1997). Findings from the 1995 PEQIS study on distance education indicate that institutions support these goals. For instance, a large majority of higher education institutions using distance education reported that improving access by making courses available at convenient locations and by reducing time constraints were somewhat or very important goals in their decision to use distance education. However, research evidence on the impact of distance education on access, as well as research evidence on distance education's impact on both enrollments and program costs, is not conclusive (Gladieux and Swail 1999).

How is Distance Education Delivered?

The development of technologies employed to provide distance education have resulted from a "push-pull" relationship between providers and the public: technological advances have created awareness and demand among users, while usage has pushed providers to further develop technologies (Gladieux and Swail 1999). According to Sherron and Boettcher (1997), these advances have produced over the years four different generations of distance education technology. These generations are summarized in exhibit 1 and described briefly below.

Key differentiating characteristics of the generations of technologies of distance education include:

- the number of individuals that can be simultaneously supported in communication (i.e., one-way, two-way, or multiple-way communication);
- the amount and types of information (voice, video, data) that can be communicated (i.e., whether the communication channels are "broadband" or "narrowband"); and
- the speed at which that information is communicated (i.e., whether the return rate is fast or slow).

The technologies predominantly used in distance education in the early and mid-20th century (such as print, radio, and television) can be characterized as one-way narrowband communication. These first-generation distance education technologies, thus, were best used to transfer information primarily from faculty to student. This delivery mode did not typically incorporate any interaction among students and only supported minimal interaction between students and faculty. One additional constraint among first-generation broadcast technologies was that they were time dependent (i.e., radio and television broadcasts occurred only at specific, predetermined times that required the student to be listening or watching at those times).

Second-generation technologies began to emerge by 1960 and represented a significant advancement in that they addressed the time dependency issue of first-generation technologies. The advent of the VCR and cable television enabled "timeshifting" of the broadcast portion of distance education courses, as well as the alternative of bypassing broadcast completely by making the content of courses available on videotapes that could be sent to students and viewed at any time. In other respects, however, distance education courses that employ this generation of technology are not so dissimilar from the previous generation: there tends to be little interaction among students and between students and faculty.

By the mid-1980s, the personal computer had found its way into use by distance education providers, followed not long thereafter by the advent of two-way videoconferencing. This third generation of distance education technologies, in contrast to previous generations, allowed faculty to convey increasingly complex and large amounts of information to students and enabled interaction among students and between students and faculty through the use of electronic mail, chat rooms, and bulletin boards. The advent of computer-assisted instruction, simulations, and other electronic resources accessed via computer disk, CD-ROM, or the Internet further characterizes this generation of distance education technology.

The fourth generation of distance education technologies represents still another advance. Interactivity among students and between students and faculty is increased, and the amount and types of information that can be exchanged are significantly greater and take significantly less time to occur. Indeed, these advances are further decreasing distance education's reliance on time and place and are enabling the implementation of completely virtual universities. The current landscape of distance education incorporates a number of technologies, spanning second, third, and fourth generations. Examples that were provided in the 1997–98 survey include two-way video with two-way audio, one-way prerecorded video, Internet courses using synchronous and asynchronous computer-based instruction, and CD-ROM.

Exhibit 1.—Generations of Distance Education Technologies

	First Generation	Second Generation	Third Generation	Fourth Generation
Primary Feature	Predominantly one technology	Multiple technologies without computers	Multiple technologies including computers and computer networking	Multiple technologies including the beginning of high-bandwidth computer technologies
Timeframe	1850s to 1960	1960 to 1985	1985 to 1995	1995 to 2005 (est.)
Media	• Print (1890+) • Radio (1930s) • Television (1950s and 1960s)	• Audiocassettes • Television • Videocassettes • Fax • Print	• Electronic mail, chat sessions, and bulletin boards using computers and computer networks • Computer programs and resources packaged on disks, CDs, and the Internet • Audioconferencing • Seminar and large-room videoconferencing via terrestrial, satellite, cable, and phone technologies • Fax • Print	• Electronic mail, chat sessions, and bulletin boards using computers and computer networks plus high-bandwidth transmission for individualized, customized, and live video interactive learning experiences • Computer programs and resources packaged on disks, CDs, Internet • Audioconferencing • Desktop videoconferencing via terrestrial, satellite, cable, and phone technologies • Fax • Print
Communication Features	• Primarily one-way communication • Interaction between faculty and student by telephone and mail • Occasionally supplemented by onsite facilitators and student mentors	• Primarily one-way communication • Interaction between faculty and student by telephone, fax, and mail • Occasionally supplemented by face-to-face meetings	• Significant broadband communication from faculty to students via print, computer programs, and videoconferencing • Two-way interactive capabilities enabling asynchronous and synchronous communication between faculty and students and among students • Internet good for text, graphics, and video snippets	• Two-way interactive real-time capabilities of audio and video • Asynchronous and synchronous communication between faculty and students and among students • Full 30-frame-per-second digital video transmission with databases of content resources available via the Internet and World Wide Web • Lengthy digital video programming available on demand

SOURCE: Sherron and Boettcher 1997.

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In characterizing different implementations of distance education, it is important to note that research does not conclusively support the notion that more advanced technologies necessarily represent better distance education implementations (Hanson et al. 1997). Different distance education technologies meet different instructional and learner needs and the consequent costs to implement different technologies for institutions and students vary. For instance, Tuckey (1993, as cited in Hanson et al. 1997) compared the use of an electronic whiteboard, a form of synchronous audio-conferencing, and asynchronous computer conferencing, concluding that each form of technology had its advantages: "Visual channels enabled through the whiteboard technology may be more important in subject areas such as mathematics and the sciences, whereas [computer conferencing] may be more suitable in areas requiring extensive discourse" (p. 70). Furthermore, other factors such as learner ages, cultural and socioeconomic backgrounds, interests and experiences, educational levels, and familiarity with distance education methods and delivery systems may all be associated with the effectiveness of distance education (Sherry 1996).

How is Distance Education Organized?

With the increased capabilities of newer generations of distance education technology, postsecondary institutions are being forced to revisit, if not altogether redefine, their missions (Ehrmann n.d.; Gallick 1998). In this regard, the forces acting upon postsecondary institutions are no different than those acting upon larger society. New technologies are challenging fundamental assumptions about the nature and organization of work, as well as the need for workers to engage in continuous learning (e.g., Carnevale 1991; Kelly 1998). A range of unconventional providers, such as corporate universities and unaffiliated distance learning providers, have entered the postsecondary marketplace, offering instruction and credentials in new settings, on flexible schedules—blurring lines between public and private, for-profit and not-for-profit (Gladieux and Swail 1999).

Indeed, the institutional response to technology's pressure on organizational structures and relationships can be traced back over 20 years (Oblinger and Maruyama 1996). Through the end of the 1970s, institutions generally acted individually with regard to distance education, creating their own materials or purchasing them from other institutions. With the advent of satellite technology in the 1980s, consortia of institutions formed to share the correspondingly high costs of course development and delivery. With the rise of the networked computer and the Internet, the 1990s have brought pressure on institutions to consider their niche in an even broader national or international distance education marketplace, thereby fostering innovations in institution-to-institution relationships.

One way to conceptualize these new and emerging arrangements of institutions is by considering what distinguishes different types of postsecondary providers, both in terms of who provides the education and who awards the degree or certificate. Phipps, Wellman, and Merisotis (1998) created such a typology and identified four basic types of organizational arrangements employed by institutions that provide distance education:

- **Enhancements to traditional campus-based instruction**. Perhaps the most prevalent form of distance education occurs as an enhancement to campus-based instruction offered at traditional colleges and universities. In this type of arrangement, students are regularly matriculated, enrolled in the usual courses, taught by the same faculty, and are generally on campus all or most of the time they are studying. The instruction can be offered through off-campus centers as well as on campus. The difference is that distance education students are not in the same location as their instructors. Distance education arises primarily through faculty initiatives to employ available technologies and may be particularly beneficial to students who live off campus or who work full- or part-time.

- **Consortia or collaboratives**. Another form of distance education is provided by consortia or collaboratives that represent cooperative pooling and sharing arrangements among institutions (typically, traditional colleges and universities). In these arrangements, multiple institutions join together to provide distance education on a statewide or regional basis. The authority to award degrees and credits, however, remains with each member institution and does not shift to the consortium.
- **Contracted or brokered arrangements**. Contracted or brokered arrangements are configurations of institutions, faculty, or other providers brought together solely for the purpose of delivering distance education. In contrast to consortia or collaboratives, the authority to award degrees and credits rests with the contracting or organizing entity, not with the originating institution.
- **Virtual universities**. Virtual universities are institutions that offer most or all of their instruction via technological means and are distinguished by their nearly exclusive use of technology as the educational delivery device.

As new types of organizational arrangements emerge, challenges to the flexibility of the higher education community may continue. For now, distance education providers are offering traditional and nontraditional students alike the opportunity to pursue postsecondary education through a variety of arrangements (Phipps, Wellman, and Merisotis 1998).

How Effective is Distance Education?

As distance education has grown, so has interest in its effectiveness. Research on the effectiveness of distance education typically seeks to compare the performance, attitudes, and satisfaction of distance education students with those of traditional on-campus students (Phipps and Merisotis 1999). Like research on other educational interventions, the distance education literature is largely anecdotal in nature (Hanson et al. 1997), contains a considerable amount of cross-referencing (where many of the papers and summaries cite similar research or reference each other), consists of only a rather small body of high-quality original research (Phipps and Merisotis 1999), and—given the rapid evolution of distance education—is dated.

Three recent reviews of the distance education research offer some insights into its effectiveness. An oft-cited report entitled *The No Significant Difference Phenomenon* (Russell 1999) compiles hundreds of sources that indicate that the learning outcomes of distance education students are similar to the learning outcomes of traditional on-campus students. This body of work also suggests that the attitudes and satisfaction of distance education students are generally positive. Other reviews of this body of evidence are more critical (Phipps, Wellman, and Merisotis 1998), arguing that there is not conclusive evidence to indicate that student learning outcomes are higher in the vast majority of distance education settings than in traditional on-campus ones. Noting issues with the quality of the research base, Hanson and his colleagues (1997) in their review of the distance education literature tentatively conclude that:

- Distance education is just as effective as traditional education in regards to learner outcomes.
- Distance education learners generally have a more favorable attitude toward distance education than traditional learners have, and distance learners feel they learn as well as if they were in a regular classroom.
- Successful distance education learners tend to be abstract learners who are intrinsically motivated and possess internal locus of control.
- Each form of distance education technology has its own advantages and disadvantages in contributing to the overall quality of the learning experience.

Despite these tentative statements, studies comparing the outcomes of distance education students with traditional on-campus students,

while commonly conducted, have been criticized by many as inappropriate (Hanson et al. 1997):

> It is likely that when different media treatments of the same informational content to the same students yields similar learning results, the cause of the results can be found in a method which the two treatments share in common...give up your enthusiasm for the belief that media attributes cause learning (Clark 1994, 28)

In addition to general concerns about quality and appropriateness, researchers also have identified gaps in the existing research base on distance education. For instance, according to Phipps and Merisotis (1999) the research on distance education:

- tends to emphasize student outcomes for individual courses rather than for a total academic program;
- does not take into account differences among students;
- does not adequately explain why the dropout rates of distance learners are higher;
- does not take into consideration how the different learning styles of students relate to the use of particular technologies;
- focuses mostly on the impact of individual technologies rather than on the interaction of multiple technologies;
- does not include a theoretical or conceptual framework; and
- does not adequately address the impact of access to resource materials and support services.

Emerging Policy Issues

According to Phipps, Wellman, and Merisotis (1998), the pace at which institutions are moving into technology-mediated learning is remarkable. Predictions are that distance education—which was once a "poor and often unwelcome stepchild within the academic community"—will continue to have a profound impact on postsecondary institutions and their faculty (Phipps and Merisotis 1999, 29). As Kenneth Green, project director of the Campus Computing Project, asserts: "The genie will not go back into the bottle: demand for technology will continue, not diminish; the opportunities for distance and online education will grow, not recede" (1997, J-9). Evidence of this can be seen in the adoption of distance education by postsecondary institutions, as well as recent legislation supporting distance education. For instance, Public Law 105-224 (enacted October 7, 1998), which extends the authorization of programs under the Higher Education Act, contains three provisions related to distance education:

- The Distance Education Demonstration Program, which is intended to test the quality and viability of distance education programs currently ineligible for student aid funds under Title IV of the Act;
- The Learning Anytime Anywhere Partnerships program, which is intended to support innovative partnerships among colleges, employers, technology companies, and others to implement asynchronous distance education on a national or regional scale; and
- The Web-Based Education Commission, which is charged with conducting a thorough study to assess the educational software available in retail markets for secondary and postsecondary students who choose to use such software.

The support and adoption of distance education has led to the emergence of a number of policy issues that postsecondary institutions face:

- **Equity of access to postsecondary education**. Many assert that the primary benefit of distance education is that access to postsecondary education is increased. However, distance education requires that students have access to appropriate (and sometimes costly) technology and that they know how to use it (Phipps and Merisotis 1999), and some have raised concerns about special challenges students with disabilities face in accessing distance education

(*Chronicle of Higher Education*, October 29, 1999). Currently, there is very little information available on how many students are actually making use of distance education course offerings, and we know even less about the characteristics of distance learners. Without such information, there is no way to know whether distance education is reaching those who might not otherwise have access to postsecondary education, or simply accommodating those who already take advantage of such opportunities (Gladieux and Swail 1999).

- **The costs of developing and implementing distance education programs**. Some have asserted that distance education programs are a cost-savings approach to providing postsecondary education, but cost information is scant (Gladieux and Swail 1999). Anecdotally, there is some evidence to suggest that these costs savings are not being universally realized (*New York Times* 1998). Given these concerns, it is important to note that more than 60 percent of colleges and universities do not have an information technology financial plan in place (Green 1998).

- **Accreditation of and quality assurance in distance education programs**. Distance education poses many challenges to the traditional model of academic accreditation. Some fear that quality assurance mechanisms are being bypassed by some distance education providers and that the risk is a degradation of public perception about the meaning of a college degree and an increase in the potential for consumer fraud and abuse (Phipps, Wellman, and Merisotis 1998). On the other hand, online institutions have been accredited using established standards; for example, the North Central Association's Commission on Institutions of Higher Education have evaluated and accredited online institutions (e.g., Jones International) using the Commission's accreditation standards (*Chronicle of Higher Education*, November 4, 1999).

- **Copyright and intellectual property rights**. As more course syllabi, readings, and discussions occur on line, ownership of intellectual property—a legally complex and potentially controversial issue—is a continuing source of debate in the university setting. A fourth of colleges and universities have a campus policy regarding intellectual property for Web-based instructional resources developed by faculty (Green 1998).

- **Changes and challenges facing the role of postsecondary faculty**. The rise of distance education poses significant and substantial challenges to faculty compensation practices and existing norms of faculty development (Sherron and Boettcher 1997), including issues of promotion and tenure, release time, course load, course updating and revision, publishing, faculty mentoring, and consistency across departments.

- **Pressures on existing organizational structures and arrangements**. As previously noted, changes in distance education technology are having an impact on the missions and structures of participating postsecondary institutions (Ehrmann n.d.; Gallick 1998). For instance, institutions are being forced to define the differences between (traditional) residential and distance education programs, and new arrangements between the business, government, and education sectors are emerging that are challenging the traditional organization of postsecondary education.

Organization of this Report

As the preceding discussion illustrates, distance education is a topic of great interest to a number of stakeholders, including individuals considering a postsecondary education, faculty and administrators at postsecondary institutions, providers of technologies used for distance education, and policymakers at federal, state, and local levels. As such, there are a number of questions that have been raised about this phenomenon, including: How many institutions offer distance education? How many plan to in the future? How is distance education delivered? How much does it cost? Has the status of

distance education changed in recent years? The remaining chapters of this report address these questions, as well as others. The next chapter (chapter 2) provides information about the 2-year and 4-year postsecondary education institutions that offered distance education in 1997–98 and the overall enrollments in distance education offered at those institutions. Chapter 3 provides information about the total number of distance education courses offered, and the number of college-level, credit-granting distance education courses by field of study and instructional level of the course. Information about enrollments by field and level is also provided. Chapter 4 describes college-level degree and certificate programs that are designed to be completed totally through distance education. Chapter 5 describes the types of technologies that institutions used as primary modes of instructional delivery and plans for future technology use, and chapter 6 provides information about how tuition and fees for distance education courses compare to those for comparable on-campus courses. Chapter 7 provides comparisons of distance education course offerings, enrollments, degrees and certificates, and technologies between 1994–95 and 1997–98. The concluding chapter discusses the findings of this study.

2. INSTITUTIONS AND ENROLLMENTS

There is some evidence to suggest that distance education is becoming an increasingly visible feature of postsecondary education in this country. This chapter provides descriptive information about all 2-year and 4-year postsecondary education institutions that offered distance education in 1997–98, including overall enrollments in distance education courses at those institutions. Analyses of institutions and enrollments are presented by institutional type and size. Information is also included about enrollments by the level of course offerings (undergraduate or graduate/first-professional). As previously noted, the first NCES report on distance education was of higher education institutions and not of all postsecondary institutions. Consequently, trend analyses of distance education offerings and enrollments for higher education institutions can be found in chapter 7, Changes in Distance Education Since 1994–95. Since some readers may be unfamiliar with the distinction between higher education institutions and all postsecondary institutions, this chapter begins with a description of the types of institutions included in this study.

Institutions Included in This Study

This PEQIS study was designed to provide nationally representative data about distance education at 2-year and 4-year postsecondary education institutions. There are approximately 5,000 postsecondary institutions at the 2-year and 4-year level in the nation, enrolling approximately 14.4 million students.[5] Postsecondary education institutions include both institutions of higher education (traditional colleges and universities) and other postsecondary institutions (e.g., allied health and vocational-technical schools). Thus, 2-year and 4-year postsecondary institutions are a diverse group, including universities, baccalaureate colleges, community colleges, graduate and professional schools (including law, medical, and clinical psychology schools), technical schools, nursing and allied health schools, Bible colleges and seminaries, and other postsecondary schools such as business and computer processing schools. At the 4-year level (i.e., at institutions that offer baccalaureate or higher degrees), about 9 out of 10 of the private institutions are nonprofit institutions, while at the 2-year level, about half of the private institutions are nonprofit (not shown in tables). Public and private institutions have somewhat different institutional missions and constituencies, partially because of the financial support and programmatic oversight the public institutions receive from state and local governments.

The distributions of 2-year and 4-year postsecondary institutions and the enrollments of students at those institutions vary widely (see table 1). While private 2-year institutions account for 22 percent of the institutions, they enroll 2 percent of the students. The largest proportions of students attend public 2-year (37 percent) and public 4-year institutions (40 percent), although these institutions account for 25 percent and 12 percent, respectively, of 2-year and 4-year postsecondary institutions. Similarly, while 76 percent of the institutions are small (i.e., have enrollments of less than 3,000 students), 49 percent of the students attend large institutions (i.e., institutions that enroll 10,000 or more students). Thus, while about three-quarters of the institutions are small, about half of the students attend large institutions.

[5] Information about the numbers of institutions and students is from the 1996 PEQIS panel, which provided the sample for the Survey on Distance Education at Postsecondary Education Institutions, 1998–1999. The 1996 PEQIS panel was constructed from the Integrated Postsecondary Education Data System 1995–96 "Institutional Characteristics" file and the 1994 "Fall Enrollment" file.

Table 1.—Percentage distribution of 2-year and 4-year postsecondary education institutions in the nation, and the percentage distribution of students enrolled at those institutions, by institutional characteristics: 1997–98

Institutional characteristic	Institutions	Students
All institutions	100	100
Institutional type		
Public 2-year	25	37
Private 2-year	22	2
Public 4-year	12	40
Private 4-year	41	20
Size of institution		
Less than 3,000	76	19
3,000 to 9,999	16	32
10,000 or more	8	49

NOTE: Percentages are computed within each classification variable. Percentages may not sum to 100 because of rounding. Information about the distributions of institutions and students is from the 1996 PEQIS panel, which was constructed from the 1995–96 Integrated Postsecondary Education Data System (IPEDS) "Institutional Characteristics" file, and the IPEDS 1994 "Fall Enrollment" file. The 1996 PEQIS panel provides the sample for the Survey on Distance Education at Postsecondary Institutions, 1998–1999.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Institutions Offering Distance Education Courses

Institutions were asked whether they offered any distance education courses in 1997–98 (12-month academic year), or planned to offer any such courses in the next 3 years. Institutions that offered any distance education courses were asked about their total distance education offerings (including offerings for all levels and audiences), and their college-level, credit-granting distance education offerings. A third of the postsecondary education institutions at the 2-year and 4-year level offered distance education courses in 1997–98 (table 2). This represents an estimated 1,680 institutions. Another 20 percent of the institutions planned to start offering distance education courses in the next 3 years, and 47 percent did not offer and did not plan to offer distance education courses in the next 3 years.

Table 2.—Number and percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education courses in 1997–98, that planned to offer them in the next 3 years, and that did not offer and did not plan to offer them in the next 3 years, by institutional characteristics

Institutional characteristic	Total number of institutions	Offered distance education in 1997–98		Planned to offer distance education in the next 3 years		Did not offer in 1997–98 and did not plan to offer in the next 3 years	
		Number	Percent	Number	Percent	Number	Percent
All institutions	5,010	1,680	34	990	20	2,340	47
Institutional type							
Public 2-year	1,230	760	62	250	20	230	18
Private 2-year	1,120	60	5	220	20	840	75
Public 4-year	610	480	78	70	12	60	10
Private 4-year	2,050	390	19	450	22	1,210	59
Size of institution							
Less than 3,000	3,800	730	19	840	22	2,230	59
3,000 to 9,999	820	610	75	110	14	90	12
10,000 or more	400	350	87	30	8	20	5

NOTE: Percentages are based on the estimated 5,010 2-year and 4-year postsecondary education institutions in the nation. Percentages are computed across each row. Details may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Distance education was more likely to be conducted by public institutions; 78 percent of public 4-year and 62 percent of public 2-year institutions offered distance education courses, compared with 19 percent of private 4-year and 5 percent of private 2-year institutions (table 2). Distance education was also strongly related to institutional size, with most large (87 percent) and medium-sized (75 percent) institutions offering distance education in 1997–98, compared with 19 percent of small institutions. Since most students are enrolled in public 2-year and 4-year institutions and in medium and large institutions (see table 1), most students attend institutions that offer distance education courses.

There are approximately 11 million students enrolled at the institutions that offered distance education courses in 1997–98 (not shown in tables). Table 3 shows the percentage distributions of institutions that offered distance education courses in 1997–98, and the percentage distributions of students at those institutions. Among the institutions offering distance education courses, public 2-year institutions account for 45 percent of the institutions and 41 percent of the students, private 2-year institutions account for 3 percent of the institutions and less than 0.5 percent of the students, public 4-year institutions account for 28 percent of the institutions and 47 percent of the students, and private 4-year institutions account for 23 percent of the institutions and 11 percent of the students.

Table 3.—Percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education courses in 1997–98, and the percentage distribution of students enrolled at those institutions, by institutional characteristics

Institutional characteristic	Institutions	Students
All institutions	100	100
Institutional type		
Public 2-year	45	41
Private 2-year	3	(††)
Public 4-year	28	47
Private 4-year	23	11
Size of institution		
Less than 3,000	43	10
3,000 to 9,999	36	33
10,000 or more	21	58

††Less than 0.5 percent.

NOTE: Percentages are computed within each classification variable. Percentages may not sum to 100 because of rounding. Information about the distributions of institutions and students is from the 1996 PEQIS panel, which was constructed from the 1995–96 Integrated Postsecondary Education Data System (IPEDS) "Institutional Characteristics" file, and the IPEDS 1994 "Fall Enrollment" file. The 1996 PEQIS panel provides the sample for the Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 4.—Total number of 2-year and 4-year postsecondary education institutions, and the number and percent of institutions in the nation that offered distance education courses in 1997–98, by level of institutional offerings

Level of institutional offerings	Total number of institutions	Offered any distance education courses		Offered college-level, credit-granting distance education courses					
				Courses at either level		Undergraduate courses		Graduate/first-professional courses	
		Number	Percent*	Number	Percent*	Number	Percent*	Number	Percent*
All institutions	5,010	1,680	34	1,650	33	1,460	29	610	12
Institutions with undergraduate programs	4,510	1,620	36	1,590	35	1,460	32	560	12
Institutions with graduate/first-professional programs	1,860	750	40	740	40	560	30	590	32

*Percentages are based on the total number of institutions in that row.

NOTE: The numbers of institutions with undergraduate or graduate/first-professional programs do not sum to all institutions since many institutions have both levels of offerings. Information about whether an institution has undergraduate or graduate/first-professional programs (either on campus or distance education) is based on the Integrated Postsecondary Education Data System "Institutional Characteristics" file.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

About the same number of institutions offered college-level, credit-granting distance education courses in 1997–98 (1,650 institutions) as offered any distance education courses in that year (1,680; see the top row of table 4). This represents 33 percent and 34 percent, respectively, of all 5,010 postsecondary institutions at the 2-year and 4-year level. Undergraduate distance education courses were offered by 1,460 institutions, which represents 29 percent of all the institutions, and graduate/first-professional distance education courses were offered by 610 institutions, which represents 12 percent of all institutions.[6] The 1,680 institutions that offered any distance education courses in 1997–98 are the group of institutions included in the analyses for institutions that offered distance education courses at either level.[7]

Institutions can also be characterized by whether they have any undergraduate programs or graduate/first-professional programs (either on campus or distance education), as identified by the Integrated Postsecondary Education Data System (IPEDS) "Institutional Characteristics" file. These programs, as identified by IPEDS, should not be confused with the level of distance education course offerings, described in the paragraph above. Of the 5,010 postsecondary education institutions at the 2-year and 4-year level, 4,510 institutions have undergraduate programs (see row 2 of table 4), and 1,860 institutions have graduate/first-professional programs (see row 3 of table 4).[8] Of the 4,510 institutions that have any undergraduate programs, 1,620 (36 percent) offered any distance education courses in 1997–98 (row 2 of table 4). These 1,620 institutions are the group of institutions included in the analyses for institutions that offered undergraduate distance education courses. Of the 1,860 institutions that have any graduate/first-professional programs (row 3 of table 4), 750 (40 percent) offered any distance education courses in 1997–98. These 750 institutions are the group of institutions included in the analyses for

[6] The numbers of institutions offering undergraduate or graduate/first-professional distance education courses do not sum to the number of institutions offering college-level distance education courses at either level, since many institutions offer distance education courses at both levels.

[7] The 1,680 institutions are the group included for analyses of institutions that offered any distance education courses at either level or that offered college-level, credit-granting distance education courses at either level. That is, the analyses for college-level, credit-granting courses, enrollments, and degrees and certificates were not further subset to only those institutions that offered college-level, credit-granting distance education courses, since only 2 percent of the institutions offering distance education courses did not offer college-level, credit-granting distance education courses. This analysis approach was used throughout the report.

[8] IPEDS identifies 1,370 of the 5,010 institutions as having programs at both the undergraduate and graduate/first-professional levels.

institutions that offered distance education courses at the graduate/first-professional level.[9]

Overall Enrollment in Distance Education Courses

Institutions that offered any distance education courses were asked about the total enrollment in all distance education courses in 1997–98 (including enrollments in courses designed for all types of students), and the enrollment in college-level, credit-granting distance education courses in 1997–98, both overall and by the level of the course. If a student was enrolled in multiple courses, institutions were instructed to count the student for each course in which he or she was enrolled. Thus, enrollments may include duplicated counts of students.[10]

The PEQIS survey indicates that there were an estimated 1,661,100 enrollments in all distance education courses offered by 2-year and 4-year postsecondary institutions in 1997–98 (table 5). There were an estimated 1,363,670 enrollments in college-level, credit-granting distance education courses in 1997–98, with most of these (1,082,380) at the undergraduate level. The remaining enrollments (281,300) were at the graduate/first-professional level. To put these numbers into context, the National Center for Education Statistics (NCES) estimates that there were 14.6 million students enrolled in 2-year and 4-year postsecondary education institutions in fall 1996 (the most recent year for which information is available), with an estimated 12.5 million students enrolled at the undergraduate level, and an estimated 2.1 million students enrolled at the graduate/first-professional level (unpublished tabulations from the 1996 IPEDS "Fall Enrollment" file).[11] Consistent with the distributions of the percentage of institutions that offered distance education courses, most of the enrollments in distance education courses were at public 2-year and public 4-year institutions. In addition, the number of enrollments in college-level, credit-granting distance education courses was considerably higher at public 2-year institutions than at public 4-year institutions.

Private 4-year institutions put relatively more emphasis on distance education at the graduate/first-professional level than did public 4-year institutions (table 5). That is, for public 4-year institutions, 36 percent of the enrollments in college-level distance education courses (163,080 out of 452,600) were at the graduate/first-professional level, compared with 57 percent at the graduate/first-professional level for private 4-year institutions (118,070 out of 208,590). This may be because public and private postsecondary institutions have different institutional missions and constituencies, or because private institutions are approaching distance education more selectively, focusing more on specialized programs and professional school offerings (*Chronicle of Higher Education*, June 20, 1997; Mulugetta and Mulugetta 1999).

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[9] Of the 1,680 institutions that offered any distance education courses in 1997–98, IPEDS identifies 690 institutions as having any programs (either on campus or distance education) at both the undergraduate and graduate/first-professional levels.

[10] This approach was used because discussions with institutions during the survey development process indicated that institutions could not report unduplicated counts of students enrolled in distance education courses.

[11] It is important to remember that the distance education enrollments collected in the PEQIS survey may include duplicated counts of students, while the NCES estimate of 14.6 million students enrolled is an unduplicated count of students. Information about total course enrollments at postsecondary institutions is not available for comparison to the PEQIS distance education course enrollments.

Table 5.—Total number of enrollments in all distance education courses, and the number of enrollments in college-level, credit-granting distance education courses offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics

Institutional characteristic	Total number of institutions	Number of institutions that offered distance education courses	Total number of enrollments in all distance education courses[1]	Number of enrollments in college-level, credit-granting distance education courses		
				Enrollment in courses at both levels[1]	Enrollments in undergraduate courses[2]	Enrollments in graduate/ first-professional courses[3]
All institutions	5,010	1,680	1,661,100	1,363,670	1,082,380	281,300
Institutional type[4]						
Public 2-year	1,230	760	714,160	690,700	690,550	—
Public 4-year	610	480	711,350	452,600	289,520	163,080
Private 4-year	2,050	390	222,350	208,590	90,520	118,070
Size of institution						
Less than 3,000	3,800	730	382,060	270,400	177,150	93,250
3,000 to 9,999	820	610	477,470	461,880	413,770	48,100
10,000 or more	400	350	801,570	631,400	491,460	139,950

— Too few cases for a reliable estimate. Two-year branches of public 4-year institutions occasionally offer graduate/first-professional level courses.

[1]Includes information for the estimated 1,680 institutions that offered any distance education courses in 1997–98.

[2]Includes information for the estimated 1,620 institutions that had undergraduate programs and that offered any distance education courses in 1997–98.

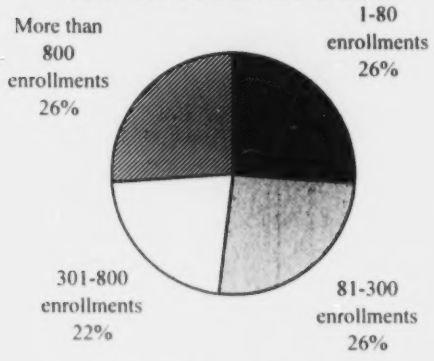
[3]Includes information for the estimated 750 institutions that had graduate or first-professional programs and that offered any distance education courses in 1997–98.

[4]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

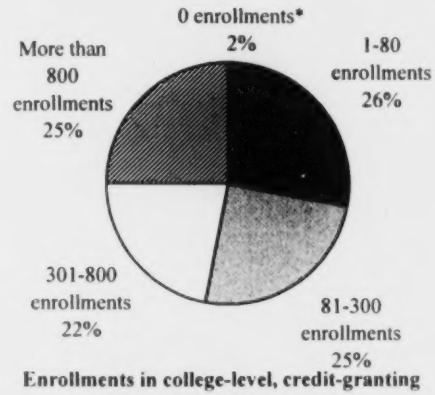
NOTE: Numbers may not sum to totals because of rounding and not reporting where there are too few cases for a reliable estimate. Enrollments may include duplicated counts of students, since institutions were instructed to count a student enrolled in multiple courses for each course in which he or she was enrolled.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Figure 1.—Percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 according to number of enrollments in distance education courses



Enrollments in all distance education courses



Enrollments in college-level, credit-granting distance education courses

*Two percent of the institutions that offered any distance education courses did not offer college-level, credit-granting distance education courses.

NOTE: Percentages are based on the estimated 1,680 institutions that offered any distance education courses in 1997–98. Enrollments may include duplicated counts of students, since institutions were instructed to count a student enrolled in multiple courses for each course in which he or she was enrolled.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

About half of the institutions that offered distance education courses in 1997–98 had 300 or fewer enrollments in those courses; 26 percent had 80 or fewer enrollments (figure 1). The distributions are similar for enrollments in all distance education courses, and for enrollments in college-level, credit-granting distance education courses.

Summary

A third of 2-year and 4-year postsecondary education institutions offered any distance education courses in 1997–98, and another 20 percent planned to start offering distance education courses in the next 3 years. The likelihood of offering distance education was strongly related to institutional type and size, with distance education being much more common at public 2-year and 4-year institutions than at private 2-year and 4-year institutions, and at medium and large compared with small institutions. These 2-year and 4-year postsecondary institutions had an estimated 1,661,100 enrollments in all distance education courses in 1997–98, and an estimated 1,363,670 enrollments in college-level, credit-granting distance education courses, with most of these at the undergraduate level. Consistent with the distributions of institutions offering distance education, most of the enrollments in distance education courses were at public 2-year and public 4-year institutions. About half of the institutions that offered distance education courses in 1997–98 had 300 or fewer enrollments in those courses.

3. COURSE OFFERINGS AND ENROLLMENTS

Comprehensive information about the courses available through distance education and enrollments in those courses has not been widely available. To address this gap in the knowledge base, this chapter provides information about the total number of distance education courses offered, and the number of college-level, credit-granting distance education courses offered by general field of study and instructional level of the course (undergraduate or graduate/first-professional). The chapter begins with information about the number of distance education courses offered in 1997–98. The fields of study included in this report are then defined. The chapter concludes with discussions of course offerings and enrollments by field of study and instructional level of the course.

Number of Distance Education Courses Offered in 1997–98

An estimated 54,470 different distance education courses[12] were offered in the 12-month 1997–98 academic year by 2-year and 4-year postsecondary education institutions (table 6). This included both noncredit and credit-granting distance education courses designed for all types and levels of students, including elementary/secondary, college, adult basic education, continuing professional education, etc. An estimated 49,690 different college-level, credit-granting distance education courses were offered in 1997–98, with most of those (35,550) at the undergraduate level. The remaining credit-granting courses (14,140) were at the graduate/first-professional level. Consistent with the distributions of the percentage of institutions that offered distance education courses, most of the distance education courses were offered by public 2-year and public 4-year institutions (43,800 out of 54,470, or 80 percent, for total distance education courses, and 39,360 out of 49,690, or 79 percent, for college-level, credit-granting distance education courses).

Private 4-year institutions put particular emphasis on offering college-level, credit-granting distance education courses (9,740 out of 10,060, or 97 percent of their total distance education courses), while a somewhat higher percentage of distance education courses provided by public 2-year and public 4-year institutions were not college-level, credit-granting courses (table 6). At public 2-year institutions, 92 percent (18,860 out of 20,410) of their total distance education courses were college-level, credit-granting courses; at public 4-year institutions, 88 percent (20,500 out of 23,390) of the total distance education courses were college-level credit-granting courses. This may be because public and private postsecondary institutions have different institutional missions and constituencies, leading public institutions to offer more courses for other audiences, such as elementary/secondary or adult basic education students, or to offer more noncredit courses, such as continuing professional education for medical workers.

[12] If a course had multiple sections or was offered multiple times during the academic year, institutions were instructed to count it as only one course.

Table 6.—Total number of different distance education courses, and the number of different college-level, credit-granting distance education courses offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics

Institutional characteristic	Total number of institutions	Number of institutions that offered distance education courses	Total number of different distance education courses offered[1]	Number of different college-level, credit-granting distance education courses offered		
				Courses at both levels[1]	Undergraduate courses[2]	Graduate/ first-professional courses[3]
All institutions	5,010	1,680	54,470	49,690	35,550	14,140
Institutional type[4]						
Public 2-year	1,230	760	20,410	18,860	18,820	—
Public 4-year	610	480	23,390	20,500	11,190	9,310
Private 4-year	2,050	390	10,060	9,740	4,950	4,790
Size of institution						
Less than 3,000	3,800	730	16,180	14,230	10,510	3,720
3,000 to 9,999	820	610	17,030	15,920	13,530	2,390
10,000 or more	400	350	21,260	19,550	11,510	8,030

—Too few cases for a reliable estimate. Two-year branches of public 4-year institutions occasionally offer graduate/first-professional level courses.

[1]Includes information for the estimated 1,680 institutions that offered any distance education courses in 1997–98.

[2]Includes information for the estimated 1,620 institutions that had undergraduate programs and that offered any distance education courses in 1997–98.

[3]Includes information for the estimated 750 institutions that had graduate or first-professional programs and that offered any distance education courses in 1997–98.

[4]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

NOTE: Numbers may not sum to totals because of rounding and not reporting where there are too few cases for a reliable estimate. If a course had multiple sections or was offered multiple times during the academic year, institutions were instructed to count it as only one course.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

About half of the institutions that offered distance education courses in 1997–98 offered 15 or fewer different distance education courses; 23 percent offered 1 to 5 courses (figure 2). The distributions of courses are similar for the total number of distance education courses and for the number of college-level, credit-granting distance education courses. Two percent of the institutions that offered distance education courses offered only distance education courses that were not college-level, credit-granting courses. This included colleges offering courses below the college level (e.g., adult basic education), Bible colleges and seminaries offering noncredit Bible courses, and professional schools offering noncredit continuing education courses.

Figure 2.—Percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 according to number of distance education courses

*Two percent of the institutions that offered any distance education courses did not offer college-level, credit-granting distance education courses.

NOTE: Percentages are based on the estimated 1,680 institutions that offered any distance education courses in 1997–98. Percentages may not sum to 100 because of rounding. If a course had multiple sections or was offered multiple times during the academic year, institutions were instructed to count it as only one course.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Course Offerings Included in the Study

Institutions that offered distance education courses in 1997–98 were asked about their college-level, credit-granting distance education courses by general field of study and the instructional level of the course (i.e., whether the course was an undergraduate course or a graduate/first-professional course). The general fields of study provided on the questionnaire and examples of what is included under each are as follows:

- *Agriculture and natural resources:* agricultural business and production, agricultural sciences, conservation and renewable natural resources;
- *Business and management:* business administration, accounting, administrative assistant/secretarial skills, human resources management, marketing;
- *Education:* general teacher education, special education, curriculum and instruction, education administration and supervision;
- *Engineering:* general engineering, civil, electrical, and mechanical engineering, engineering-related technologies;
- *Mathematics:* mathematics, statistics;
- *Computer science:* general computer science, computer programming, computer systems analysis;
- *Physical and biological/life sciences:* biology, chemistry, physics, geology;
- *English, humanities, social and behavioral sciences:* English language and literature, foreign languages, philosophy, history, economics, psychology, sociology;
- *Library and information sciences:* library science, librarianship;
- *Health professions:* nursing, medicine, pharmacy, physical therapy, medical and laboratory technology, health services administration;
- *Vocational/technical fields:* air conditioning and heating repair, computer and electronics technology, drafting; and
- *Other fields:* all areas not covered above. Institutions were asked to specify what the other fields were. The most frequently mentioned were theology and biblical studies. Also frequently mentioned were art, physical education, law and legal sciences, and student and career development courses.

Some of the categories of general fields of study are much broader than others.[13] For example, the category of English, humanities, and social and behavioral sciences is very broad, while mathematics is very narrow. This can influence whether an institution offers courses (either on campus or through distance education) in that general field. In addition, some of the fields of study are much more specialized than others, and are offered (either on campus or through distance education) by fewer institutions than are many of the other fields. For example, courses in agriculture and natural resources and library and information sciences are offered by fewer institutions than are courses in physical and biological/life sciences. Some fields of study (both on campus and distance education) also vary by institutional type. For example, courses in agriculture and natural resources are offered primarily by community colleges and public land-grant universities, courses in vocational/technical fields are offered primarily by public 2-year community and technical colleges, and biblical and theological studies are heavily concentrated in religiously affiliated colleges and seminaries. Fields that are part of a general undergraduate education, however, such as English, humanities, and social and behavioral sciences, and physical and biological/life sciences, are much more likely to be offered (either on campus or through distance education) by most types of institutions.

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[13] In preparing the list of general fields of study for the questionnaire, considerations included the time institutions would have to spend in sorting their courses into the various categories, distinctions between the fields of study, and some general assumptions about the prevalence of distance education offerings in various fields. These assumptions were based on discussions with institutions during the survey development process, and articles on distance education from media sources such as the *Chronicle of Higher Education*.

All of these factors should be kept in mind when interpreting the following sections on courses and enrollments by fields of study.

Course Offerings by Field of Study

About two-thirds (70 percent) of the institutions that offered any distance education courses in 1997–98 offered college-level, credit-granting distance education courses in the broad category of English, humanities, and the social and behavioral sciences; 55 percent offered for-credit distance education courses in business and management (table 7). About a third of the institutions offering any distance education courses in 1997–98 offered college-level, credit-granting distance education courses in the health professions (36 percent), physical and biological/life sciences (33 percent), and mathematics (32 percent); 29 percent offered for-credit distance education courses in education; and 26 percent offered for-credit distance education courses in computer sciences. College-level, credit-granting distance education courses were offered in the remaining fields of study by 17 percent or fewer of the institutions that offered distance education courses in 1997–98.

The general pattern was for institutions to offer for-credit distance education courses in the various fields of study more at the undergraduate level than at the graduate level. For example, 71 percent of the institutions that had any undergraduate programs and that offered distance education courses in 1997–98 offered for-credit undergraduate distance education courses in English, humanities, and the social and behavioral sciences, compared with 22 percent of the institutions that had any graduate/first-professional programs offering for-credit distance education courses at the graduate/first-professional level (table 7). An exception to this general pattern was in the field of education, where 19 percent of the institutions with undergraduate programs offered for-credit undergraduate distance education courses in education, compared with 40 percent of the institutions with graduate/first-professional programs offering for-credit distance education courses at the graduate/first-professional level. For-credit engineering and library and information sciences courses were also offered more often at the graduate/first-professional level than at the undergraduate level.

Table 7.—Percent of 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that offered college-level, credit-granting distance education courses in various fields of study in 1997–98, by course level and field

Field	Courses at either level[1]	Undergraduate courses[2]	Graduate/ first-professional courses[3]
English, humanities, social and behavioral sciences	70	71	22
Business and management	55	51	30
Health professions	36	31	24
Physical and biological/life sciences	33	32	8
Mathematics	32	32	7
Education	29	19	40
Computer science	26	25	10
Vocational/technical fields	17	17	3
Engineering	12	9	16
Agriculture and natural resources	7	7	3
Library and information sciences	6	4	7
Other fields	16	13	13

[1]Based on the estimated 1,680 institutions that offered any distance education courses in 1997–98.

[2]Based on the estimated 1,620 institutions that had undergraduate programs and that offered any distance education courses in 1997–98.

[3]Based on the estimated 750 institutions that had graduate or first-professional programs and that offered any distance education courses in 1997–98.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Public 2-year institutions were more likely than public 4-year institutions, which in turn were more likely than private 4-year institutions, to offer for-credit distance education courses in English, humanities, and the social and behavioral sciences, physical and biological/life sciences, mathematics, computer science, and vocational/technical fields (table 8). Public 4-year institutions were more likely than either public 2-year or private 4-year institutions to offer for-credit distance education courses in the health professions, education, engineering, agriculture and natural resources, and library and information sciences. For-credit distance education courses in business and management were about equally likely to be offered at public 2-year and 4-year institutions, which were both more likely to offer them than private 4-year institutions. Private 4-year institutions were more likely than either public 2-year or public 4-year institutions to offer for-credit distance education courses in the "other fields" category. A large portion of the courses shown in the "other fields" category consists of courses in biblical and theological studies offered by religiously affiliated colleges and seminaries.

Table 8.—Percent of all 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that offered college-level, credit-granting distance education courses in various fields of study in 1997–98, by institutional type and field

Field	All institutions	Institutional type*		
		Public 2-year	Public 4-year	Private 4-year
English, humanities, social and behavioral sciences	70	85	73	40
Business and management	55	62	61	36
Health professions	36	36	50	19
Physical and biological/life sciences	33	45	35	11
Mathematics	32	46	28	13
Education	29	14	61	22
Computer science	26	33	25	14
Vocational/technical fields	17	29	12	1
Engineering	12	5	29	8
Agriculture and natural resources	7	7	14	0
Library and information sciences	6	4	13	1
Other fields	16	12	12	30

*Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals.

NOTE: Percentages are based on the estimated 1,680 institutions that offered any distance education courses in 1997–98. Zeros appear in the table when no institution in the sample gave the indicated response.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

The largest number of college-level, credit-granting distance education courses offered in 1997–98 was in the broad category of English, humanities, and the social and behavioral sciences, with 14,900 different courses (table 9). The next largest number of for-credit distance education courses was in business and management (8,160 different courses). These two general fields of study are also the fields in which the largest percentage of institutions offered distance education courses (see table 7). Large numbers of for-credit distance education courses were also offered in education (4,990), the health professions (4,440), engineering (3,950), and other fields (3,590; table 9). An estimated 2,400 different for-credit distance education courses were offered in computer science, 2,340 in vocational/technical fields, 2,160 in physical and biological/life sciences, and 1,730 in mathematics.

As with the percentage of institutions offering distance education courses, the general pattern in the number of for-credit courses offered was for more courses to be offered at the undergraduate than at the graduate/first-professional level (table 9). For example, this was the case in fields that are part of a general undergraduate education, such as English, humanities, and the social and behavioral sciences, physical and biological/life sciences, and mathematics. The exceptions to this pattern were the fields of education, engineering, and library and information sciences, where the number of courses offered was higher at the graduate/first-professional level than at the undergraduate level. Possible reasons for the number of distance education courses offered in these fields being higher at the graduate/first-professional level include emphasis on graduate education in these fields, the ability to convey graduate-level course content in these fields using distance education, and the likelihood that groups of students would be located in one place (such as a school district or engineering firm) to receive an instructional broadcast that was targeted to them. For example, many teachers are required to obtain

Table 9.—Number of different college-level, credit-granting distance education courses offered in various fields by 2-year and 4-year postsecondary education institutions in 1997–98, by course level and field

Field	Courses at both levels[1]	Undergraduate courses[2]	Graduate/ first-professional courses[3]
All fields	49,690	35,550	14,140
English, humanities, social and behavioral sciences	14,900	13,690	1,210
Business and management	8,160	6,330	1,830
Health professions	4,440	2,630	1,810
Physical and biological/life sciences	2,160	1,890	270
Mathematics	1,730	1,510	220
Education	4,990	1,470	3,520
Computer science	2,400	1,810	590
Vocational/technical fields	2,340	2,210	—
Engineering	3,950	1,020	2,930
Agriculture and natural resources	620	500	—
Library and information sciences	420	110	310
Other fields	3,590	2,390	1,190

—Too few cases for a reliable estimate.

[1]Includes information for the estimated 1,680 institutions that offered any distance education courses in 1997–98.

[2]Includes information for the estimated 1,620 institutions that had undergraduate programs and that offered any distance education courses in 1997–98.

[3]Includes information for the estimated 750 institutions that had graduate or first-professional programs and that offered any distance education courses in 1997–98.

NOTE: Numbers may not sum to totals because of rounding and not reporting where there are too few cases for a reliable estimate. If a course had multiple sections or was offered multiple times during the academic year, institutions were instructed to count it as only one course.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

a master's degree to continue teaching or to receive increases in their pay, and school districts sometimes accommodate this requirement by arranging for distance education courses in education to be received at a site in their district that is readily available to teachers. Technology-intensive fields such as engineering are likely to require constant updating of knowledge and skills beyond the bachelor's degree, and may be more amenable to distance education than fields that require laboratory work, such as biology and chemistry. For example, Stanford University has been using its instructional television network to broadcast graduate courses in engineering to corporate sites throughout the country for nearly 30 years (*Chronicle of Higher Education*, June 20, 1997).

Public 2-year institutions offered more for-credit distance education courses than public 4-year institutions in English, humanities, and the social and behavioral sciences, business and management, computer science, and mathematics (table 10). Public 4-year institutions offered more for-credit distance education courses than public 2-year institutions in the health professions and education. For engineering, agriculture and natural resources, and library and information sciences, there were too few cases for reliable estimates of the number of courses offered at public 2-year institutions. For private 4-year institutions, the number of courses offered could not be reported for most of the fields of study because there were too few cases for reliable estimates. Where the data could be reported, the number of for-credit distance education courses offered by private 4-year institutions was lower than at public 2-year institutions in English, humanities, and the social and behavioral sciences and in business and management. The number of for-credit distance education courses offered by private 4-year institutions was lower than at public 4-year institutions in English, humanities, and the social and behavioral sciences and in the health professions. The number of for-credit distance education courses offered in the "other fields" category was higher for private 4-year institutions than for public 4-year institutions.

Table 10.—Number of different college-level, credit-granting distance education courses offered in various fields by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional type and field

Field	All institutions	Institutional type*		
		Public 2-year	Public 4-year	Private 4-year
All fields	49,690	18,860	20,500	9,740
English, humanities, social and behavioral sciences	14,900	8,090	4,990	1,680
Business and management	8,160	3,450	2,600	1,970
Health professions	4,440	1,260	2,170	980
Physical and biological/life sciences	2,160	1,090	870	—
Mathematics	1,730	860	600	—
Education	4,990	340	3,930	—
Computer science	2,400	960	710	—
Vocational/technical fields	2,340	1,800	420	—
Engineering	3,950	—	3,020	—
Agriculture and natural resources	620	—	460	—
Library and information sciences	420	—	340	—
Other fields	3,590	650	390	2,500

—Too few cases for a reliable estimate

*Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals.

NOTE: The table includes information for the estimated 1,680 institutions that offered any distance education courses in 1997–98. Numbers may not sum to totals because of rounding and not reporting where there are too few cases for a reliable estimate. If a course had multiple sections or was offered multiple times during the academic year, institutions were instructed to count it as only one course.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Enrollments by Field of Study

Institutions were also asked to report about enrollments in college-level, credit-granting distance education courses by general field of study and the instructional level of the course. Enrollments may include duplicated counts of students, since institutions were instructed to count a student enrolled in multiple courses for each course in which he or she was enrolled. As discussed in chapter 2, there were an estimated 1,363,670 enrollments in college-level, credit-granting distance education courses in 1997–98. The largest number of enrollments in college-level, credit-granting distance education courses was in the broad category of English, humanities, and the social and behavioral sciences, with 537,220 enrollments (table 11). There were also relatively large numbers of enrollments in business and management (212,620). These two general fields of study were also the fields with the largest number of courses offered (see table 9).

As with the distributions of credit-granting distance education courses offered, the general pattern for enrollments was for there to be more enrollments in courses offered at the undergraduate level than in courses offered at the graduate/first-professional level (table 11). The exceptions to this pattern were in engineering and education, where enrollments were higher in courses offered at the graduate/first-professional level than in courses offered at the undergraduate level. The field of library and information sciences also shows higher enrollments at the graduate/first-professional level than at the undergraduate level, but the difference is not statistically significant, due at least in part to so few institutions offering distance education courses in this field.

Table 11.—Number of enrollments in college-level, credit-granting distance education courses offered in various fields at 2-year and 4-year postsecondary education institutions in 1997–98, by course level and field

Field	Enrollments in courses at both levels[1]	Enrollments in undergraduate courses[2]	Enrollments in graduate/ first-professional courses[3]
All fields	1,363,670	1,082,380	281,300
English, humanities, social and behavioral sciences	537,220	513,840	23,380
Business and management	212,620	170,010	42,610
Health professions	97,890	64,760	33,130
Physical and biological/life sciences	83,810	80,260	3,550
Mathematics	47,700	45,230	2,460
Education	147,400	38,700	108,710
Computer science	69,690	58,970	10,720
Vocational/technical fields	43,290	41,690	—
Engineering	38,910	12,390	26,530
Agriculture and natural resources	12,900	11,380	—
Library and information sciences	13,120	5,040	8,080
Other fields	59,120	40,130	18,990

—Too few cases for a reliable estimate.

[1]Includes information for the estimated 1,680 institutions that offered any distance education courses in 1997–98.

[2]Includes information for the estimated 1,620 institutions that had undergraduate programs and that offered any distance education courses in 1997–98.

[3]Includes information for the estimated 750 institutions that had graduate or first-professional programs and that offered any distance education courses in 1997–98.

NOTE: Numbers may not sum to totals because of rounding and not reporting where there are too few cases for a reliable estimate. Enrollments may include duplicated counts of students, since institutions were instructed to count a student enrolled in multiple courses for each course in which he or she was enrolled.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Public 2-year institutions had higher distance education enrollments than public 4-year institutions in the following fields (see table 12): English, humanities, and the social and behavioral sciences, business and management, physical and biological/life sciences, mathematics, computer science, and vocational/technical fields. The number of enrollments in the broad category of English, humanities, and social and behavioral sciences is particularly large at public 2-year institutions; it accounts for about half of the distance education enrollments at these institutions. Courses in this broad category constitute a large portion of lower division coursework at the undergraduate level, suggesting that many of the enrollments in distance education courses at public 2-year institutions could be used to fulfill lower division course requirements. Distance education enrollments at public 4-year institutions were higher than at public 2-year institutions in education; the difference for the health professions was not statistically significant. As with the number of courses offered, some of the enrollment data by field of study cannot be reported for private 4-year institutions because there were too few cases for reliable estimates. Where the data could be reported, enrollments at private 4-year institutions were lower than at public 2-year and public 4-year institutions, except in the "other fields" category, which did not differ significantly.

Table 12.—Number of enrollments in college-level, credit-granting distance education courses offered in various fields at 2-year and 4-year postsecondary education institutions in 1997–98, by institutional type and field

Field	All institutions	Institutional type*		
		Public 2-year	Public 4-year	Private 4-year
All fields	1,363,670	690,700	452,600	208,590
English, humanities, social and behavioral sciences	537,220	355,130	133,210	47,830
Business and management	212,620	99,120	76,050	36,180
Health professions	97,890	39,250	48,310	9,900
Physical and biological/life sciences	83,810	59,390	18,710	—
Mathematics	47,700	30,830	11,620	—
Education	147,400	13,080	81,530	—
Computer science	69,690	36,640	15,140	—
Vocational/technical fields	43,290	30,960	6,930	—
Engineering	38,910	—	29,440	—
Agriculture and natural resources	12,900	—	10,160	—
Library and information sciences	13,120	—	8,520	—
Other fields	59,120	18,130	12,990	24,650

— Too few cases for a reliable estimate.

*Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals.

NOTE: The table includes information for the estimated 1,680 institutions that offered any distance education courses in 1997–98. Numbers may not sum to totals because of rounding and not reporting where there are too few cases for a reliable estimate. Enrollments may include duplicated counts of students, since institutions were instructed to count a student enrolled in multiple courses for each course in which he or she was enrolled.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Summary

There were an estimated 54,470 different distance education courses offered in 1997–98 (including courses designed for all types of students), and an estimated 49,690 different college-level, credit-granting distance education courses, with most of these in courses at the undergraduate level. This is consistent with the pattern of enrollments discussed in chapter 2. The largest numbers of courses and enrollments were in the broad category of English, humanities, and social and behavioral sciences. There were also large numbers of enrollments in business and management, education, and the health professions. With the exceptions of engineering, education, and library and information sciences, the general pattern was for the numbers of courses to be higher at the undergraduate level than at the graduate/first-professional level. As with the distributions of distance education courses offered, the general pattern was for there to be more enrollments in courses offered at the undergraduate level than in courses offered at the graduate/first-professional level.

4. DEGREE AND CERTIFICATE PROGRAMS

While taking individual courses through distance education has the potential to increase access to postsecondary education among those who traditionally have not had access, it is the possibility of completing degree and certificate programs solely through distance education that offers the potential for the most dramatic changes in access and opportunity. This chapter presents information about the prevalence of distance education degree and certificate programs in all postsecondary institutions by institutional type, level of the degree and certificate programs, and general field of study. Trend analyses for the subset of higher education institutions can be found in chapter 7, Changes in Distance Education Since 1994–95.

Institutions Offering Degree and Certificate Programs

In 1997–98, 8 percent of all 2-year and 4-year postsecondary education institutions had any college-level degree or certificate programs that were designed to be completed totally through distance education (table 13).[14] Among the 34 percent of institutions that offered any distance education courses in 1997–98, 25 percent had any college-level degree or certificate programs that were designed to be completed totally through distance education. Among all institutions, public 4-year institutions were more likely than the other types of institutions to have distance education degree and certificate programs; 30 percent of all public 4-year institutions had any distance education degree or certificate programs, compared with 8 percent of public 2-year and 6 percent of private 4-year institutions. Degree programs were more prevalent than certificate programs; 22 percent of the institutions that offered distance education courses offered degree programs and 7 percent offered certificate programs. Both degree and certificate programs were more likely to be offered at the graduate/first-professional level than at the undergraduate level (31 percent compared with 13 percent for degrees, and 9 percent compared with 4 percent for certificates).

Table 14 shows the percentage of institutions that offered distance education courses in 1997–98 that had degree and certificate programs designed to be completed totally through distance education, by field of study and instructional level of the distance education degree or certificate program. Overall, distance education degree and certificate programs were not widely offered in most fields. Graduate/first-professional degree programs were most likely to be offered in business and management, the health professions, education, and engineering, although the percentages of institutions offering programs in these fields were still quite low.

[14]For this survey, institutions were instructed to include only degree or certificate programs based on credit-granting courses. They were also instructed to include programs that may require a small amount of on-campus coursework or labwork, clinical work in hospitals, or similar arrangements. An example of this type of program would be a nursing program where students receive all their coursework through distance education and then complete their clinical work in hospitals located near their homes. Institutions were also instructed to include baccalaureate degree completion programs, which are programs where students enter an institution with an associate's degree (or the equivalent number of credits) and then complete their final 2 years of coursework at the new institution. These are sometimes structured as articulation programs between community colleges and public 4-year colleges in the state, with students completing the first 2 years of coursework on campus at the community college, and then receiving the last 2 years of coursework through a distance education baccalaureate completion program offered by the public 4-year college.

Table 13.—Percent of all 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98, and the percent that had college-level degree or certificate programs designed to be completed totally through distance education in 1997–98, by institutional characteristics

Institutional characteristic	Offered any distance education courses[1]	Had any college-level degree or certificate programs		Degree programs			Certificate programs		
		All institutions[1]	Institutions with distance education courses[2]	Degree programs at either level[2]	Undergraduate degree programs[3]	Graduate/first-professional degree programs[4]	Certificate programs at either level[2]	Undergraduate certificate programs[3]	Graduate/first-professional certificate programs[4]
All institutions	34	8	25	22	13	31	7	4	9
Institutional type[5]									
Public 2-year	62	8	13	11	11	(†)	4	4	(†)
Public 4-year	78	30	39	38	18	34	10	4	8
Private 4-year	19	6	32	29	14	26	11	3	11
Size of institution									
Less than 3,000	19	4	20	17	10	24	7	3	11
3,000 to 9,999	75	14	19	18	13	20	4	2	3
10,000 or more	87	39	44	42	21	51	16	8	14

†Not applicable for 2-year institutions.

[1]Based on the estimated 5,010 2-year and 4-year postsecondary education institutions in the nation.

[2]Based on the estimated 1,680 institutions that offered any distance education courses in 1997–98.

[3]Based on the estimated 1,620 institutions that had undergraduate programs and that offered any distance education courses in 1997–98.

[4]Based on the estimated 750 institutions that had graduate or first-professional programs and that offered any distance education courses in 1997–98.

[5]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 14.—Percent of 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that had college-level degree or certificate programs in various fields that were designed to be completed totally through distance education, by level and field

Field	Degree programs		Certificate programs	
	Undergraduate degree programs[1]	Graduate/ first-professional degree programs[2]	Undergraduate certificate programs[1]	Graduate/ first-professional certificate programs[2]
English, humanities, social and behavioral sciences	3	4	(††)	1
Business and management	4	11	1	2
Health professions	3	9	1	3
Physical and biological/life sciences	(††)	1	(††)	(††)
Mathematics	0	(††)	0	(††)
Education	1	9	1	2
Computer science	1	4	1	1
Vocational/technical fields	1	1	1	0
Engineering	1	8	(††)	1
Agriculture and natural resources	(††)	1	(††)	(††)
Library and information sciences	0	1	(††)	(††)
Liberal/general studies	4	(††)	0	0
Other fields	1	3	(††)	0

††Less than 0.5 percent.

[1]Based on the estimated 1,620 institutions that had undergraduate programs and that offered any distance education courses in 1997–98.

[2]Based on the estimated 750 institutions that had graduate or first-professional programs and that offered any distance education courses in 1997–98.

NOTE: Zeros appear in the table when no institution in the sample gave the indicated response.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Number of Degree and Certificate Programs

In 1997–98, 2-year and 4-year postsecondary institutions offered an estimated 1,230 college-level degree programs that were designed to be completed totally through distance education (table 15). There were a larger number of degree programs at the graduate/first-professional level than at the undergraduate level (720 compared with 500). Public 4-year institutions offered twice as many degree programs as private 4-year institutions, which in turn offered more degree programs than did public 2-year institutions. Particularly notable are the 520 graduate/first-professional degree programs offered by public 4-year institutions, which constitute approximately 42 percent of the total 1,230 distance education degree programs offered. There were also an estimated 340 college-level distance education certificate programs offered in 1997–98, with 160 at the undergraduate level and 170 at the graduate/first-professional level. Information about certificate programs is not presented by institutional characteristics because there were too few cases for reliable estimates by institutional characteristics.

Table 15.—Number of college-level degree and certificate programs designed to be completed totally through distance education offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics

Institutional characteristic	Degree programs			Certificate programs		
	Degree programs at both levels[1]	Undergraduate degree programs[2]	Graduate/first-professional degree programs[3]	Certificate programs at both levels[1]	Undergraduate certificate programs[2]	Graduate/first-professional certificate programs[3]
All institutions	1,230	500	720	340	160	170
Institutional type[4]						
Public 2-year	150	150	(†)	—	—	(†)
Public 4-year	720	210	520	—	—	—
Private 4-year	360	—	210	—	—	—
Size of institution						
Less than 3,000	310	—	—	—	—	—
3,000 to 9,999	290	120	—	—	—	—
10,000 or more	630	200	440	—	—	—

†Not applicable for 2-year institutions.

—Too few cases for a reliable estimate.

[1]Includes information for the estimated 1,680 institutions that offered any distance education courses in 1997–98.

[2]Includes information for the estimated 1,620 institutions that had undergraduate programs and that offered any distance education courses in 1997–98.

[3]Includes information for the estimated 750 institutions that had graduate or first-professional programs and that offered any distance education courses in 1997–98.

[4]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

NOTE: Numbers may not sum to totals because of rounding and not reporting where there are too few cases for a reliable estimate.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

The number of distance education degree programs cannot be estimated for most of the fields of study because there were too few cases for reliable estimates for most fields. Of the estimated 500 undergraduate distance education degree programs offered in 1997–98, there were an estimated 120 undergraduate distance education degree programs in business and management, and 70 in liberal/general studies, which is a common degree area at community colleges (table 16). The number of undergraduate distance education degree programs could not be estimated for the remaining fields. Of the estimated 720 graduate/first-professional distance education degree programs offered in 1997–98, there were an estimated 210 programs in engineering, 140 in business and management, 110 in education, and 100 in the health professions. The number of graduate/first-professional degree programs could not be estimated for the remaining fields. The number of distance education certificate programs could not be estimated for any of the fields.

Table 16.—Number of college-level degree programs in selected fields designed to be completed totally through distance education offered by 2-year and 4-year postsecondary education institutions in 1997–98, by level and field

Field	Undergraduate degree programs[1]	Graduate/first-professional degree programs[2]
Business and management	120	140
Health professions	—	100
Education	—	110
Engineering	—	210
Liberal/general studies	70	—

—Too few cases for a reliable estimate.

[1]Includes information for the estimated 1,620 institutions that had undergraduate programs and that offered any distance education courses in 1997–98.

[2]Includes information for the estimated 750 institutions that had graduate or first-professional programs and that offered any distance education courses in 1997–98.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Summary

In 1997–98, degree and certificate programs designed to be completed totally through distance education were offered by 8 percent of all 2-year and 4-year postsecondary education institutions and by 25 percent of the postsecondary institutions that offered distance education courses. Degree programs were more prevalent than certificate programs and were more likely to be offered at the graduate/first-professional level than at the undergraduate level. Public 4-year institutions were particularly likely to have distance education degree and certificate programs. Overall, distance education degree and certificate programs were not widely offered in most fields of study. Graduate/first-professional degree programs were most likely to be offered in business and management, the health professions, education, and engineering, although the percentages of institutions offering programs in these fields were still quite low. There were an estimated 1,230 college-level degree programs and 340 college-level certificate programs designed to be completed totally through distance education.

5. DISTANCE EDUCATION TECHNOLOGIES

Changes in the types of technologies available for delivering distance education, including changes in the capabilities of networking technology and the rise of the Internet, have played a role in the adoption of distance education by postsecondary institutions. This chapter provides information about the types of technologies employed by all postsecondary institutions to deliver distance education. The chapter begins by defining the technologies included in this study, and then proceeds to describe the technologies used during 1997–98 by institutional type. To provide insight into the dynamic nature of distance education technologies, the chapter concludes with information about postsecondary institutions' plans for the use of various technologies in the next 3 years. Trend analyses for the subset of higher education institutions can be found in chapter 7, Changes in Distance Education Since 1994–95.

Technologies Included in This Study

This study asked about the following technologies available for the instructional delivery of distance education courses. Courses conducted exclusively through written correspondence were not included in this study.

- *Video technologies:* two-way video with two-way audio (also referred to as two-way interactive video), one-way video with two-way audio, one-way live video, and one-way prerecorded video (including prerecorded videotapes provided to students, and television broadcast and cable transmission using prerecorded video).
- *Audio technologies:* two-way audio transmission (e.g., audio/phone conferencing) and one-way audio transmission (including radio broadcast and prerecorded audiotapes provided to students).
- *Internet-based technologies:* Internet courses using synchronous (i.e., simultaneous or "real time") computer-based instruction (e.g., interactive computer conferencing or Interactive Relay Chat), and Internet courses using asynchronous (i.e., not simultaneous) computer-based instruction (e.g., e-mail, listserves, and most World Wide Web-based courses).
- *Other technologies:* CD-ROM, mixed mode packages (i.e., a mix of technologies that cannot be assigned to a primary mode), and an open-ended "other, specify" category.

Instructional Technologies Used in 1997–98

Institutions that offered distance education courses in 1997–98 were asked which types of technology the institution used as a primary mode of instructional delivery for distance education courses in 1997–98. An individual course could have only one predominant mode of delivery.[15] Institutions could, however, indicate that they used many different technologies as primary modes of instructional delivery across all of their distance education courses, since different distance education courses could use different types of technology. Information was not collected about the number of courses offered using each technology as the primary instructional delivery mode, only whether the institution used it at all as a primary mode of instruction for distance education courses.

[15] If a course used multiple technologies to deliver instruction but one mode predominated, institutions were instructed to indicate the predominant mode for the course. If no primary mode could be identified, then the course would be considered to use a mixed-mode package as the primary mode of instructional delivery.

More institutions used asynchronous Internet instruction (58 percent of institutions), two-way interactive video (54 percent), and one-way prerecorded video (47 percent) than used any of the other technologies as a primary mode of instructional delivery for distance education courses (table 17). Nineteen percent of the institutions offered courses using synchronous Internet instruction, and 14 percent used one-way video with two-way audio. Eight percent or fewer of the institutions used each of the other technologies (see table 17) as a primary instructional mode. Thus, the results indicate that more institutions used several types of video technologies and the Internet-based technologies than the other modes of delivery.

Differences in the use of the technologies may vary by institutional type due to factors such as the differing costs and resources required for various technologies, the kinds of students that are targeted by the different types of institutions, and the different kinds of courses that are offered by the institutions. The results indicate that the likelihood of using some of the technologies did vary substantially by institutional type. For example, among institutions offering distance education courses in 1997–98, two-way interactive video was more likely to be used by public 4-year institutions (80 percent) than by any other type of institution, and by public 2-year institutions (53 percent) more than private 4-year institutions (29 percent; table 17). One-way prerecorded video was reported as a primary mode of instruction more often by public 2-year institutions (62 percent) than by either public or private 4-year institutions, and by public 4-year institutions (44 percent) more often than by private 4-year institutions (26 percent). The Internet technologies, however, were generally about equally likely to be used by the various types of institutions, ranging from 16 percent to 22 percent for synchronous Internet instruction, and from 57 percent to 61 percent for asynchronous Internet instruction.

Table 17.—Percent of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 indicating that the institution used various types of technology as a primary mode of instructional delivery for distance education courses in 1997–98, by institutional characteristics

Institutional characteristic	Two-way video with two-way audio (two-way interactive video)	One-way video with two-way audio	One-way live video	One-way prerecorded video	Two-way audio transmission	One-way audio transmission	Internet courses using synchronous computer-based instruction	Internet courses using asynchronous computer-based instruction	CD-ROM	Multimode packages	Other technologies
All institutions	54	14	6	47	6	6	19	58	7	8	2
Institutional type*											
Public 2-year	53	15	7	62	4	4	16	57	7	7	1
Public 4-year	80	22	9	44	7	5	22	58	8	12	2
Private 4-year	29	3	0	26	8	13	19	61	4	4	2
Size of institution											
Less than 3,000	45	9	3	29	7	8	15	51	5	3	2
3,000 to 9,999	57	13	6	56	4	3	19	59	7	10	1
10,000 or more	66	26	12	68	6	9	26	69	10	14	4

*Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

NOTE: Percentages are based on the estimated 1,680 institutions that offered any distance education courses in 1997–98. Percentages sum to more than 100 because institutions could use different types of technologies as primary modes of instructional delivery for different distance education courses. Zeros appear in the table when no institution in the sample gave the indicated response.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Plans for Use of Instructional Technologies in the Next 3 Years

Institutions that offered distance education courses in 1997–98 (34 percent of all institutions) or that planned to offer distance education courses in the next 3 years (20 percent of all institutions) were asked about their plans for the use of different types of technologies as a primary mode of instructional delivery in the next 3 years. For each technology, institutions indicated whether they planned to reduce the number of courses using that technology, keep the same number of courses, start using or increase the number of courses, or had no plans to use that technology in the next 3 years. For each of the technologies, 1 percent or fewer of the institutions planned to reduce their use of that technology as a primary instructional delivery mode in the next 3 years (table 18). Eleven percent of the institutions indicated that they planned to keep the same number of courses using one-way prerecorded video.

Institutions planned to start using or increase their use of asynchronous Internet instruction as a primary mode of delivery more than any other type of technology, with 82 percent of the institutions planning to start or increase their use of this technology (table 18). Two-way interactive video (cited by 61 percent) and synchronous Internet instruction (cited by 60 percent) were also frequently indicated as technologies planned for an increasing role in delivering distance education in the next 3 years. About a third of institutions planned to start using or increase their use of one-way prerecorded video (35 percent), CD-ROM (31 percent), and multi-mode packages (30 percent). Seventeen percent or fewer of the institutions planned to start using or increase their use of the remaining technologies.

Table 18.—Percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education in 1997–98 or that planned to offer distance education in the next 3 years according to their plans for the next 3 years concerning the number of distance education courses that will be offered, by type of technology that will be used as the primary mode of instructional delivery

Technology	Reduce the number	Keep the same number	Start or increase the number	No plans to use the technology
Two-way video with two-way audio (two-way interactive video)	1	4	61	34
One-way video with two-way audio	1	3	17	79
One-way live video	1	1	14	84
One-way prerecorded video	1	11	35	54
Two-way audio transmission	(††)	2	9	88
One-way audio transmission	1	1	9	89
Internet courses using synchronous computer-based instruction	(††)	1	60	39
Internet courses using asynchronous computer-based instruction	0	1	82	16
CD-ROM	0	1	31	69
Multi-mode packages	(††)	1	30	69
Other technologies	(††)	(††)	3	96

††Less than 0.5 percent.

NOTE: Percentages are based on the estimated 2,580 institutions that either offered distance education courses in 1997–98 (1,680 institutions), or that planned to offer distance education courses in the next 3 years and could report about their technology plans (900 institutions). Percentages are computed across each row, but may not sum to 100 because of rounding. Zeros appear in the table when no institution in the sample gave the indicated response.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 19 shows the percentage of institutions that planned to start or increase their use of the technologies in the next 3 years, presented separately for institutions that offered distance education in 1997–98 and institutions that planned to start offering distance education in the next 3 years. Plans for the two groups were not significantly different for most technologies. Two-way interactive video, asynchronous Internet instruction, and multi-mode packages were some exceptions. For each of these three technologies, institutions that offered distance education courses in 1997–98 were more likely than institutions that planned to start offering distance education in the next 3 years to plan to start or increase their use of this technology.

Table 19.—Percent of 2-year and 4-year postsecondary education institutions offering distance education in 1997–98 or planning to offer distance education in the next 3 years that planned to start or increase their use of various types of technologies as the primary mode of instructional delivery during the next 3 years

Technology	Institutions that offered distance education in 1997–98[1]	Institutions that planned to offer distance education in the next 3 years[2]
Two-way video with two-way audio (two-way interactive video)	65	52
One-way video with two-way audio	16	19
One-way live video	12	16
One-way prerecorded video	37	30
Two-way audio transmission	9	10
One-way audio transmission	10	8
Internet courses using synchronous computer-based instruction	59	62
Internet courses using asynchronous computer-based instruction	87	73
CD-ROM	32	27
Multi-mode packages	35	21
Other technologies	3	3

[1]Percentages are based on the estimated 1,680 institutions that offered distance education courses in 1997–98.

[2]Percentages are based on the estimated 900 institutions that planned to offer distance education courses in the next 3 years and could report about their technology plans.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Summary

In 1997–98, more institutions used several types of video technologies and the Internet-based technologies to deliver distance education courses than the other modes of delivery. Specifically, more institutions used asynchronous Internet instruction, two-way interactive video, and one-way prerecorded video than used any of the other technologies as a primary mode of instructional delivery.

Use of some of the technologies differed by institutional type. For example, two-way interactive video was more likely to be used by public 4-year institutions than by any other type of institution, and by public 2-year institutions more than private 4-year institutions. One-way prerecorded video was more likely to be used by public 2-year institutions than by any other type of institution, and by public 4-year institutions more than private 4-year institutions. The Internet technologies, however, were about equally likely to be used by the various types of institutions. Differences in the use of the technologies by institutional type may be due to factors such as the differing costs and resources required for the various technologies, the different kinds of courses that are offered by the institutions and how well those courses fit with the technologies, and whether the types of students targeted by the institutions are a good fit with the technologies.

The results suggest that planned investments in distance education technology over the next 3 years are more likely to be made on more advanced generations of distance education technologies. More institutions indicated plans to start using or increase their use of asynchronous Internet instruction , two-way interactive video, and synchronous Internet instruction in the next 3 years than of other technologies. This suggests that interactive video and the Internet technologies are a growing mode of delivery among postsecondary institutions.

6. TUITION AND FEES

While distance education can be seen as a cost-savings approach to providing postsecondary education, the costs of developing, implementing, and delivering distance education courses can be substantial. One might expect that institutions would pass these costs or cost savings on by charging different tuition and fees to students enrolled in distance education courses. To examine this issue, this chapter provides information about how tuition and fees for distance education courses compare to those for traditional campus-based courses. Analyses are presented by institutional type.

Tuition

Institutions were asked how the tuition charged for college-level, credit-granting distance education courses compared with tuition charged for equivalent on-campus courses. Table 20 shows how tuition costs for distance education and on-campus courses compared among institutions that offered any distance education courses in 1997–98. About three-quarters (77 percent) of the institutions charged the same tuition for distance education courses as for comparable on-campus courses. Relatively few institutions indicated that their tuition charges were always lower (3 percent) or always higher (6 percent) for distance education courses than for on-campus courses, and 14 percent indicated that

Table 20.—Percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 according to how tuition charges for college-level, credit-granting courses offered through distance education compare to tuition charges for equivalent on-campus courses at their institution, by institutional characteristics

Institutional characteristic	Tuition charges are always higher for distance education courses than for on-campus courses	Tuition charges are always lower for distance education courses than for on-campus courses	Tuition charges are always the same for both distance education and on-campus courses	Tuition charges for distance education courses are sometimes the same as, and sometimes different than, tuition charges for on-campus courses
All institutions	6	3	77	14
Institutional type*				
Public 2-year	4	0	90	6
Public 4-year	6	3	64	28
Private 4-year	6	10	71	13
Size of institution				
Less than 3,000	5	5	79	11
3,000 to 9,999	7	1	79	13
10,000 or more	5	3	70	23

*Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

NOTE: Percentages are based on the estimated 1,680 institutions that offered distance education courses in 1997–98. Zeros appear in the table when no institution in the sample gave the indicated response. Percentages are computed across each row, but may not sum to 100 because of rounding.

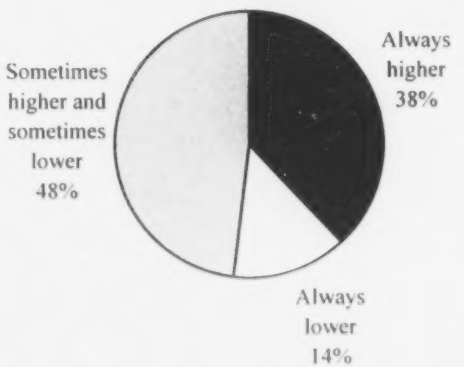
SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

their tuition charges for distance education were variable (i.e., sometimes the same as and sometimes different than for on-campus courses).[16]

Public 2-year institutions were more likely than public or private 4-year institutions to indicate that tuition charges were always the same for distance education and on-campus courses, with 90 percent of public 2-year institutions that offered distance education courses giving this response (table 20). Variable tuition charges were more common among public 4-year institutions offering distance education courses than at other types of institutions, although still a minority at 28 percent of public 4-year institutions.

Among the 14 percent of institutions with variable tuition charges for distance education courses (i.e., tuition for distance education was sometimes the same as and sometimes different than for on-campus courses), 38 percent indicated that the tuition for distance education courses was always higher than for on-campus courses when the charges differed, and 14 percent indicated that it was always lower when the charges differed (figure 3). About half (48 percent) of the institutions with variable tuition charges indicated that tuition for distance education courses was sometimes higher and sometimes lower than for on-campus courses when the tuition differed.

Figure 3.—Percentage distribution of 2-year and 4-year postsecondary education institutions with variable charges for distance education courses compared with equivalent on-campus courses in 1997–98 indicating how those tuition charges for distance education courses differ



NOTE: Percentages are based on the 14 percent of institutions that offered distance education courses in 1997–98 and that indicated that tuition charges for distance education courses are sometimes the same as, and sometimes different than, tuition charges for on-campus courses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

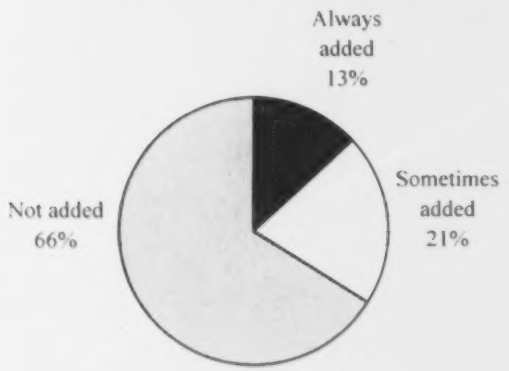
[16] At some institutions, both public and private, tuition charges are set at the same level for all students by entities such as the state legislature or the Board of Trustees. At such institutions, tuition charges would be the same for distance education and on-campus courses.

Fees

Another approach that institutions may use to offset the cost of distance education is the application of special fees to distance education courses that are not added to on-campus courses. These fees may be determined by factors such as delivery format or location. Two-thirds (66 percent) of the institutions that offered distance education courses indicated that they did not add special fees to their college-level, credit-granting distance education courses, 21 percent sometimes added special fees, and 13 percent always added special fees (figure 4).

Institutions that are not able or choose not to charge higher tuition for distance education courses may use special fees as an alternative method of collecting additional funds for these courses. However, most institutions do not appear to be using this approach. Among the 77 percent of institutions that always charge the same tuition for on-campus and distance education courses (see table 20), 74 percent do not add any special fees to distance education courses, 15 percent sometimes add special fees, and 11 percent always add special fees (figure 5). Thus, 57 percent of institutions overall are charging both comparable tuition and comparable fees for distance education and on-campus courses.

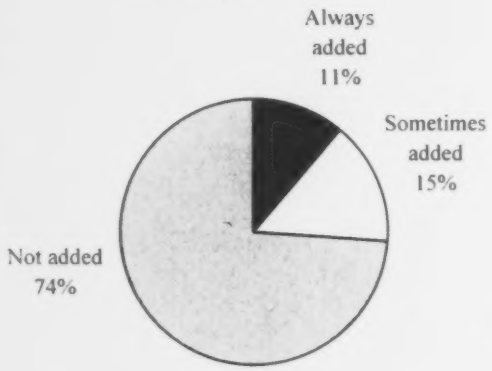
Figure 4.—Percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 indicating whether the institution adds any special fees to college-level, credit-granting distance education courses that are not added to on-campus courses



NOTE: Percentages are based on the estimated 1,680 institutions that offered distance education courses in 1997–98.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Figure 5.—Percentage distribution of 2-year and 4-year postsecondary education institutions with the same tuition for distance education and comparable on-campus courses in 1997–98 indicating whether the institution adds any special fees to college-level, credit-granting distance education courses that are not added to on-campus courses



NOTE: Percentages are based on the 77 percent of institutions offering distance education courses in 1997–98 that indicated that tuition charges are always the same for both distance education and on-campus courses.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Summary

Results indicate that most postsecondary education institutions do not pass on the costs or cost savings of distance education programs by charging different tuition or fees to students enrolled in distance education courses. About three-quarters of institutions with distance education always charge the same tuition for distance education and comparable on-campus courses. Public 2-year institutions were the most likely to indicate that tuition charges were always the same, with 90 percent of public 2-year institutions always charging comparable tuition for on-campus and distance education courses. Moreover, two-thirds of institutions do not add special fees to distance education courses that are not added to on-campus courses. Further, 57 percent of institutions charge both comparable tuition and comparable fees for distance education and on-campus courses.

7. CHANGES IN DISTANCE EDUCATION SINCE 1994–95

Chapters 2 through 6 of this report present findings on various aspects of distance education for all 2-year and 4-year postsecondary education institutions for 1997–98. This chapter provides comparisons of distance education course offerings, enrollments, degrees and certificates, and technologies at the subset of 2-year and 4-year higher education institutions for 1994–95 and 1997–98. These comparisons are based on the two PEQIS distance education studies conducted by NCES.[17] The chapter begins with an overview of the similarities and differences between the two PEQIS studies. Information is then provided about the extent of change in the percentage of institutions offering distance education courses, the number of distance education courses offered, the number of enrollments in distance education courses, the availability of distance education degree and certificate programs, and the technologies used to deliver distance education courses.

Comparing the PEQIS Studies: An Overview

The 1997–98 study was sent to all postsecondary education institutions in the PEQIS panel, both higher education and other postsecondary education institutions. In order to make comparisons between the 1997–98 study and the 1995 study, which was sent only to higher education institutions, the data from the 1997–98 study were analyzed for the subset of higher education institutions. It is the data from this subset of institutions that are presented in this chapter. Additional information about differences in the samples between the two studies is presented in appendix A.

In addition, there were slight variations in wording between some of the items on the two surveys. This included the wording for the number of distance education courses offered, enrollment in distance education courses, degree and certificate programs, and the distance education technologies used. These variations in question wording are discussed in appendix A. Also, the data from the 1995 study were not imputed for item nonresponse. However, item nonresponse was very low and did not substantially affect the results. In the following sections, item nonresponse is noted where it occurred.

Institutions Offering Distance Education Courses

In fall 1995, 33 percent of 2-year and 4-year higher education institutions offered distance education courses (table 21). In 1997–98, this had grown to 44 percent of 2-year and 4-year higher education institutions. Growth occurred for all institutional types except private 2-year, and for all sizes of institutions. The percentage of public 2-year institutions offering distance education courses grew from 58 percent to 72 percent, and the percentage of public 4-year institutions offering distance education courses increased from 62 percent to 79 percent. While distance education continued to be offered more frequently by public institutions, the percentage of private 4-year institutions offering distance education was approximately double in 1997–98 (22 percent) what it was in 1995 (12 percent).

[17] The first PEQIS study, conducted in fall 1995, sometimes asked for information about the current time frame (i.e., fall 1995), and sometimes asked for information about academic year 1994–95. Thus, both dates appear in the results section of this chapter. The second PEQIS study, conducted in winter 1998–99, is referred to as the 1997–98 study, since the data were collected for that time period.

In both 1995 and 1997–98, large percentages of private 2-year and private 4-year institutions did not offer and did not plan to offer distance education in the next 3 years (table 21). Other findings from the 1995 study suggest that some of the major reasons that institutions do not plan to offer distance education in the next few years are a perceived lack of fit between distance education and the institution's mission, a perceived lack of need for distance education, program development costs, and a limited technological infrastructure to support distance education Mulugetta and Mulugetta 1999; U.S. Department of Education 1997). These reasons may be particularly important for private institutions, especially private 2-year institutions, since private institutions are smaller than public institutions, often have fewer financial resources available to them since they do not receive public funding, and usually have different institutional missions and constituencies.

Table 21.—Percentage distribution of 2-year and 4-year higher education institutions according to current or planned offering of distance education courses, by institutional characteristics: Fall 1995 and 1997–98

Institutional characteristic	Offered distance education		Planned to offer distance education in the next 3 years		Did not offer and did not plan to offer in the next 3 years	
	1995	1997–98	1995	1997–98	1995	1997–98
All institutions	33	44	25	21	42	35
Institutional type						
Public 2-year	58	72	28	19	14	9
Private 2-year	2	6	14	24	84	70
Public 4-year	62	79	23	12	14	9
Private 4-year	12	22	27	25	61	53
Size of institution						
Less than 3,000	16	27	27	26	56	47
3,000 to 9,999	61	75	24	13	15	11
10,000 or more	76	87	14	8	10	5

NOTE: Percentages are computed across each row for each year. Percentages for 1995 are based on an estimated 3,460 higher education institutions, and for 1997–98 are based on an estimated 3,580 higher education institutions. Percentages may not sum to totals because of rounding.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Number of Distance Education Courses Offered

In the 1994–95 academic year, an estimated 25,730 distance education courses with different catalog numbers were offered by 2-year and 4-year higher education institutions (table 22).[18] By 1997–98, the number of courses had grown to 47,540 different college-level, credit-granting distance education courses, and 52,270 different distance education courses for any level or audience. Thus, the number of distance education courses offered was approximately double in 1997–98 what it was in 1994–95. Public 2-year, public 4-year, and private 4-year institutions all experienced this rapid growth in the number of distance education courses offered. However, the overall pattern by institutional type in the number of courses offered did not change. That is, most courses were offered by public 2-year and public 4-year institutions at both points in time. This is consistent with the distributions of the percentage of institutions that offered distance education at both time points (see table 21), and is also consistent with the findings on course offerings for all postsecondary institutions in 1997–98 (see table 6). Taken together, the findings for courses and institutions suggest that change is more rapid in the number of distance education course offerings by institutions, rather than in the number or percentage of institutions offering distance education courses. The increased number of distance education courses is due more to institutions adding distance education courses than to an increase in the number of institutions offering distance education.

Table 22.—Number of different distance education courses offered by 2-year and 4-year higher education institutions in 1994–95 and 1997–98, by institutional characteristics

Institutional characteristic	Total number of distance education courses with different catalog numbers offered in 1994–95[1]	Total number of different distance education courses for any level or audience offered in 1997–98[2]	Number of different college-level, credit-granting distance education courses offered in 1997–98[2]
All institutions	25,730	52,270	47,540
Institutional type[3]			
Public 2-year	10,150	20,210	18,670
Public 4-year	11,470	23,390	20,500
Private 4-year	4,030	8,420	8,120
Size of institution			
Less than 3,000	6,070	13,980	12,090
3,000 to 9,999	7,970	17,020	15,910
10,000 or more	11,700	21,260	19,550

[1]Includes information for the estimated 1,130 higher education institutions that offered distance education courses in fall 1995. The data for 1994–95 were not imputed for item nonresponse. However, there was no item nonresponse for the number of distance education courses offered.

[2]Includes information for the estimated 1,590 higher education institutions that offered any distance education courses in 1997–98.

[3]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

NOTE: Numbers may not sum to totals because of rounding and not reporting where there are too few cases for a reliable estimate.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

[18]Courses with different catalog numbers excluded multiple sections of the same course. There was no item nonresponse for the number of distance education courses in the 1995 study.

Enrollment in Distance Education Courses

There were an estimated 753,640 formal enrollments in distance education courses at 2-year and 4-year higher education institutions in the 1994–95 academic year (table 23).[19] By 1997–98, the number of enrollments had grown to 1,343,580 enrollments in college-level, credit-granting distance education courses, and 1,632,350 enrollments in all distance education courses.[20] Thus, as with courses, distance education enrollments overall were approximately double in 1997–98 what they were in 1994–95. Public 2-year, public 4-year, and private 4-year institutions all experienced rapid growth in enrollments. For public 4-year institutions, the number of enrollments in all distance education courses was approximately triple in 1997–98 (711,350) what it was in 1994–95 (234,020). Enrollment growth was somewhat less at these public 4-year institutions for college-level, credit-granting distance education courses, with 452,600 enrollments in 1997–98. As with the number of courses offered, most of the enrollments in all types of distance education courses in both years were in public 2-year and public 4-year institutions.

The patterns of increases in enrollment and course offerings and the percentage of institutions offering distance education, when considered together, reinforce the suggestion that while more institutions began to offer distance education, the most dramatic changes were in the number of distance education courses and enrollments.

Table 23.—Number of enrollments in 1994–95 and 1997–98 in distance education courses offered by 2-year and 4-year higher education institutions, by institutional characteristics

Institutional characteristic	Total number of formal enrollments in distance education courses in 1994–95[1]	Total number of enrollments in all distance education courses in 1997–98[2]	Total number of enrollments in college-level, credit-granting distance education courses in 1997–98[2]
All institutions	753,640	1,632,350	1,343,580
Institutional type[3]			
Public 2-year	414,160	712,170	688,710
Public 4-year	234,020	711,350	452,600
Private 4-year	104,960	206,210	199,650
Size of institution			
Less than 3,000	116,320	353,870	250,870
3,000 to 9,999	232,750	476,900	461,310
10,000 or more	404,570	801,570	631,400

[1]Includes information for the estimated 1,130 higher education institutions that offered distance education courses in fall 1995. The data for 1994–95 were not imputed for item nonresponse. However, only 0.6 percent of the institutions offering distance education courses did not report the number of enrollments in those courses.

[2]Includes information for the estimated 1,590 higher education institutions that offered any distance education courses in 1997–98.

[3]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

NOTE: Numbers may not sum to totals because of rounding and not reporting where there are too few cases for a reliable estimate. Enrollments may include duplicated counts of students, since institutions were instructed to count a student enrolled in multiple courses for each course in which he or she was enrolled.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

[19]The data for the 1995 study were not imputed for item nonresponse. However, only 0.6 percent of the institutions offering distance education courses did not report the number of enrollments in those courses.

[20]In both studies, if a student was enrolled in multiple courses, institutions were instructed to count the student for each course in which he or she was enrolled. Thus, enrollments may include duplicated counts of students.

Degree and Certificate Programs

In fall 1995, 23 percent of the institutions that offered distance education courses offered degrees that students could complete by taking distance education courses exclusively, and 7 percent offered certificates that could be completed this way (table 24).[21] These percentages were essentially unchanged for 1997–98, with 22 percent having degree programs and 7 percent having certificate programs designed to be completed totally through distance education. Although there was no change in the percentage of institutions offering degree and certificate programs, the number of programs offered increased, from 690 degrees and 170 certificates in fall 1995[22] to 1,190 degree programs and 330 certificate programs in 1997–98. Thus, while the percentage of institutions offering distance education degree and certificate programs did not increase, the number of such degree and certificate programs did grow. This suggests that the growth in degree and certificate programs was due to increases among institutions that already offered such programs, rather than to an increase in the number of institutions offering such programs.

Table 24.—Percent of 2-year and 4-year higher education institutions offering distance education courses that offered distance education degree and certificate programs, and the number of such programs in 1995 and 1997–98

Type of program	Percent offering		Total number offered	
	1995[1]	1997–98[2]	1995[1]	1997–98[2]
Degree programs	23	22	690	1,190
Certificate programs.....	7	7	170	330

[1]Based on the estimated 1,130 higher education institutions that offered distance education courses in fall 1995. The data for 1995 were not imputed for item nonresponse. There was no item nonresponse for the percentage of institutions offering degrees and certificates, and 1.3 percent of the institutions offering distance education courses did not report the number of degree and certificate programs.

[2]Based on the estimated 1,590 higher education institutions that offered any distance education courses in 1997–98.

NOTE: The wording of the questions differed slightly in the two surveys. In 1995, the survey asked for the number of different degrees or certificates students can receive by taking distance education courses exclusively. In 1997–98, the survey asked for the number of college-level degree or certificate programs based on credit-granting courses that were designed to be completed totally through distance education.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

[21]There was no item nonresponse in the percentage of institutions offering degrees and certificates in the 1995 study.

[22]The data for the 1995 study were not imputed for item nonresponse. However, only 1.3 percent of the institutions offering distance education courses did not report the number of degree and certificate programs.

Distance Education Technologies

In 1995, more institutions used two-way interactive video (57 percent) and one-way prerecorded video (52 percent) than any of the other technologies (table 25).[23] In 1997–98, the technologies used by more institutions than any of the other technologies were Internet courses using asynchronous computer-based instruction (60 percent), two-way interactive video (56 percent), and one-way prerecorded video (48 percent).[24] Thus, the percentages of institutions using two-way interactive video and one-way prerecorded video were comparable in the two years. However, the percentage of institutions offering Internet courses using asynchronous computer-based instruction grew substantially from 1995 to 1997–98, from 22 percent to 60 percent.[25] The percentage of institutions that offered Internet courses using synchronous computer-based instruction grew slightly, from 14 percent in 1995 to 19 percent in 1997–98. In general, use of the remaining technologies decreased slightly from 1995 to 1997–98.

Table 25.—Percent of 2-year and 4-year higher education institutions offering distance education courses that used various types of technologies to deliver distance education courses in 1995 and 1997–98

Technology	1995[1]	1997–98[2]
Two-way video with two-way audio (two-way interactive video)	57	56
One-way video with two-way audio	24	14
One-way live video	9	6
One-way prerecorded video	52	48
Audiographics	3	(†)
Two-way audio transmission	11	5
One-way audio transmission	10	5
Internet courses using synchronous computer-based instruction	(†)	19
Internet courses using asynchronous computer-based instruction	(†)	60
Two-way online (computer-based) interactions during instruction	14	(†)
Other computer-based technology (e.g., Internet)	22	(†)
CD-ROM	(†)	7
Multi-mode packages	(†)	8
Other technologies	5	2

†Statistic not estimated for that year.

[1]Based on the estimated 1,130 higher education institutions that offered distance education courses in fall 1995. The data for the 1995 study were not imputed for item nonresponse. However, there was no item nonresponse for these technology items.

[2]Based on the estimated 1,590 higher education institutions that offered any distance education courses in 1997–98.

NOTE: Percentages for each year sum to more than 100 because institutions could use more than one type of technology.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

[23]There was no item nonresponse for these technology items in the 1995 study.

[24]Information was not collected in either year about the number of courses offered using each technology, only whether the institution used it at all (or used it as a primary mode of instruction) for distance education courses.

[25]In 1997–98, the wording of the computer-based technologies was changed to more accurately reflect how these technologies are used. In 1995, the categories were two-way online (computer-based) interactions during instruction, and other computer-based technology (e.g., Internet). In 1997–98, the categories were Internet courses using synchronous (i.e., simultaneous) computer-based instruction (e.g., interactive computer conferencing or Interactive Relay Chat), and Internet courses using asynchronous (i.e., not simultaneous) computer-based instruction (e.g., e-mail, listserves, and most World Wide Web-based courses). For the comparisons presented in this chapter, two-way online (computer-based) interactions during instruction is considered to be approximately equivalent to Internet courses using synchronous computer-based instruction, and other computer-based technology (e.g., Internet) is considered to be approximately equivalent to Internet courses using asynchronous computer-based instruction.

Although the percentage of institutions offering Internet courses using asynchronous computer-based instruction has nearly tripled, there are a couple of points to keep in mind about these results. First, these data only provide information about whether an institution used the technology at all, and not about the extent to which it was used by the institution. That is, an institution that offered one course using this technology was counted the same way in these analyses as an institution that offered all of its courses using this technology, since information was only collected about whether an institution used this technology at all, and not about the number of courses offered with this technology. Second, while use of this technology has clearly grown quickly in the last few years, the percentage of institutions using it in 1997–98 was about the same as the percentage of institutions using two-way interactive video in that year. Thus, distance education should not be equated with online (Internet-based) education.

Table 26 shows the percentage of institutions using selected technologies by institutional type at both points in time. Across institutional types, public 4-year institutions were more likely than other types of institutions to use two-way interactive video and one-way video with two-way audio at both time points, while public 2-year institutions were more likely than other types of institutions to use one-way prerecorded video at both points in time. The computer-based technologies show an interesting pattern across the time points. While these technologies tended to be used by a larger percentage of public and private 4-year institutions than public 2-year institutions in 1995, in general these technologies were about equally likely to be used by all the types of institutions in 1997–98.

Table 26.—Percent of 2-year and 4-year higher education institutions offering distance education courses that used selected types of technologies to deliver distance education courses in 1995 and 1997–98, by institutional type

Technology	1995[1]			1997–98[2]		
	Institutional type[3]			Institutional type[3]		
	Public 2-year	Public 4-year	Private 4-year	Public 2-year	Public 4-year	Private 4-year
Two-way video with two-way audio (two-way interactive video)	49	78	40	53	80	31
One-way video with two-way audio	18	36	14	14	22	3
One-way prerecorded video	67	42	30	64	44	23
Internet courses using synchronous computer-based instruction	(†)	(†)	(†)	16	22	21
Internet courses using asynchronous computer-based instruction	(†)	(†)	(†)	59	58	66
Two-way online (computer-based) interactions during instruction	8	17	25	(†)	(†)	(†)
Other computer-based technology (e.g., Internet)	14	26	38	(†)	(†)	(†)

†Statistic not estimated for that year.

[1]Based on the estimated 1,130 higher education institutions that offered distance education courses in fall 1995. The data for the 1995 study were not imputed for item nonresponse. However, there was no item nonresponse for these technology items.

[2]Based on the estimated 1,590 higher education institutions that offered any distance education courses in 1997–98.

[3]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses to make reliable estimates.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

The information in table 26 about technology usage can also be examined within each institutional type for the two points in time. Public 2-year institutions were more likely to use one-way prerecorded video than any other technology in 1995; in 1997–98, however, public 2-year institutions were about equally likely to use one-way prerecorded video, asynchronous Internet instruction, and two-way interactive video. Public 4-year institutions were more likely to use two-way interactive video than any other technology in both 1995 and 1997–98. No technology stood out as particularly prevalent for private 4-year institutions in 1995; in 1997–98, however, private 4-year institutions were more likely to use asynchronous Internet instruction than any other technology.

Summary

Data presented in this chapter indicate that a number of changes occurred in the time period between the two studies. For example, between fall 1995 and 1997–98, the percentage of higher education institutions offering distance education courses increased by about one-third, from 33 percent to 44 percent. Growth in the percentage of institutions offering distance education occurred for all institutional types except private 2-year institutions, and for all sizes of institutions. In 1997–98, about three-quarters of the public 2-year and 4-year institutions were offering distance education courses. The number of distance education enrollments and course offerings approximately doubled between 1994–95 and 1997–98. For public 4-year institutions, increases in enrollments in all distance education courses approximately tripled in that time period.

Although the percentages of institutions offering distance education degree and certificate programs were unchanged, the number of degree and certificate programs that were offered nearly doubled. This pattern suggests that while there is change in the percentage of institutions offering distance education, the most dramatic changes appear to be within the institutions that have been offering distance education for the past 3 years—these institutions have greatly increased the number of distance education courses, enrollments, and degree and certificate programs that they offer.

With regard to changes in distance education technologies employed among all higher education institutions offering any distance education, the percentages of institutions using two-way interactive video and one-way prerecorded video were essentially the same in 1997–98 as in 1995. The use of asynchronous Internet-based technologies, however, grew from 22 percent of institutions in 1995 to 60 percent of institutions in 1997–98.

8. CONCLUSIONS

This report presents findings for the 12-month 1997–98 academic year about the status of distance education in all postsecondary education institutions. It also includes an analysis of trends in distance education since 1994–95 for the subset of higher education institutions. In the most general terms, it finds that distance education appears to have become a common feature of many postsecondary education institutions and that, by their own accounts, it will become more common in the future.

More specifically, this study found that about one-third of 2-year and 4-year postsecondary education institutions offered any courses through distance education during 1997–98, and that 25 percent of those that offered any courses through distance education also offered degree or certificate programs that could be completed entirely through distance education. Public institutions were also found to be more likely to offer distance education courses than private institutions. While institutions employed a wide variety of technologies to deliver distance education, more institutions were likely to employ several types of video and the Internet-based technologies than any other modes of delivery included in the survey.

There were an estimated 1,661,100 enrollments in distance education courses during 1997–98. The vast majority of these enrollments were in college-level, credit-granting courses, mostly at the undergraduate level. Institutions offered an estimated 54,470 different distance education courses in 1997–98. The largest number of courses were in English, humanities, and the social and behavioral sciences, and in business and management. The majority of postsecondary institutions charged students the same tuition and fees for distance education courses as they did for traditional on-campus courses.

Trend analyses reveal that the percentage of higher education institutions (a subset of all postsecondary institutions) offering courses through distance education grew by one-third from 1995 to 1997–98. The percentage of institutions offering such degree and certificate programs remained constant between 1995 and 1997–98. Between 1994–95 and 1997–98, the number of distance education enrollments and course offerings and the number of distance education degree and certificate programs approximately doubled. This suggests that the greatest growth in offerings through distance education at higher education institutions occurred not so much in terms of the percentage of institutions offering distance education, but rather in terms of the number of distance education course offerings and enrollments of those institutions that have been offering distance education since 1995.

While these findings will help to inform stakeholders—including individuals considering a postsecondary education, faculty and administrators at postsecondary institutions, providers of technologies used for distance education, and policymakers at federal, state, and local levels—they do not address many of the pertinent questions about distance education. As described in the introductory chapter, these questions include issues related to:

- equity of access to postsecondary education;
- the costs of developing and implementing distance education programs;
- accreditation of and quality assurance in distance education programs;
- copyright and intellectual property rights;
- changes in the role of postsecondary faculty and challenges facing them as a result; and
- pressures on existing organizational structures and arrangements.

Given rapidly evolving societal and institutional trends brought about by changes in technology (e.g., Carnevale 1991; Kelly 1998; Sherron and Boettcher 1997), research on distance education will continue to face fundamental challenges. These challenges include evolving conceptions and definitions of distance education[26] and the rise of nontraditional arrangements of postsecondary education institutions and programs, including the rise of virtual universities. Other basic challenges facing those conducting research on distance education include the need to respond to the information needs of stakeholders in a timely manner. In this ever-changing environment, anecdotal data often must suffice until more comprehensive studies can be conducted—studies that remain relevant for only brief periods.

It is a dynamic time for postsecondary education institutions facing the opportunities and challenges brought by technological innovation. As Gladieux and Swail (1999) assert, given the fact that computer and related technologies are evolving so quickly—and new providers and brokers of higher education proliferating so rapidly—no one knows how traditional higher education will change.

[26] For example, a definition has recently been developed through the 1998 passage of P.L. 105-244, Amendments to the Higher Education Act of 1965. This set forth a new legislative definition of distance education (Title IV, Part G, Section 488): "the term 'distance education' means an educational process that is characterized by the separation, in time or place, between instructor and student. Such term may include courses offered principally through the use of (1) television, audio, or computer transmission, such as open broadcast, closed circuit, cable, microwave, or satellite transmission; (2) audio or computer conferencing; (3) video cassettes or discs; or (4) correspondence."

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Appendix A

Survey Methodology and Data Reliability

Table of Contents

	Page
Postsecondary Education Quick Information System	A-5
Sample and Response Rates	A-5
Sampling and Nonsampling Errors	A-6
Variances	A-8
Definitions of Analysis Variables	A-8
Comparing the PEQIS Studies: Technical Notes and Limitations	A-9
Differences in the Samples	A-9
Variations in Question Wording	A-10
Background Information	A-11

List of Appendix Tables

Table

A	Number and percentage distribution of postsecondary education institutions in the study, and the estimated number and percentage distribution in the nation, for the total sample and for institutions that offered distance education courses in 1997–98, by institutional characteristics: 1998–1999	A-7

Postsecondary Education Quick Information System

The Postsecondary Education Quick Information System (PEQIS) was established in 1991 by the National Center for Education Statistics, U.S. Department of Education. PEQIS is designed to conduct brief surveys of postsecondary institutions or state higher education agencies on postsecondary education topics of national importance. Surveys are generally limited to two or three pages of questions, with a response burden of about 30 minutes per respondent. Most PEQIS institutional surveys use a previously recruited, nationally representative panel of institutions. The PEQIS panel was originally selected and recruited in 1991–92. In 1996, the PEQIS panel was reselected to reflect changes in the postsecondary education universe that had occurred since the original panel was selected. A modified Keyfitz approach was used to maximize overlap between the 1996 panel and the 1991–92 panel. The sampling frame for the PEQIS panel recruited in 1996 was constructed from the 1995–96 Integrated Postsecondary Education Data System (IPEDS) "Institutional Characteristics" file. Institutions eligible for the PEQIS frame for the panel recruited in 1996 included 2-year and 4-year (including graduate-level) institutions (both institutions of higher education and other postsecondary institutions), and less-than-2-year institutions of higher education located in the 50 states and the District of Columbia: a total of 5,353 institutions.

The PEQIS sampling frame for the panel recruited in 1996 was stratified by instructional level (4-year, 2-year, less-than-2-year), control (public, private nonprofit, private for-profit), highest level of offering (doctor's/first-professional, master's, bachelor's, less than bachelor's), total enrollment, and status as either an institution of higher education or other postsecondary institution. Within each of the strata, institutions were sorted by region (Northeast, Southeast, Central, West), whether the institution had a relatively high minority enrollment, and whether the institution had research expenditures exceeding $1 million. The sample of 1,669 institutions was allocated to the strata in proportion to the aggregate square root of total enrollment. Institutions within a stratum were sampled with equal probabilities of selection. The modified Keyfitz approach resulted in 80 percent of the institutions in the 1996 panel overlapping with the 1991–92 panel. Panel recruitment was conducted with the 338 institutions that were not part of the overlap sample. During panel recruitment, 20 institutions were found to be ineligible for PEQIS, primarily because they had closed or offered just correspondence courses. The final unweighted response rate at the end of PEQIS panel recruitment with the institutions that were not part of the overlap sample was 98 percent (312 of the 318 eligible institutions). The final participation rate across the 1,669 institutions that were selected for the 1996 panel was 1,628 participating institutions out of 1,634 eligible institutions. There were 1,634 eligible institutions because 15 institutions in the overlap sample were determined to be ineligible for various reasons.

Each institution in the PEQIS panel was asked to identify a campus representative to serve as survey coordinator. The campus representative facilitates data collection by identifying the appropriate respondent for each survey and forwarding the questionnaire to that person.

Sample and Response Rates

The sample for this survey consisted of all of the institutions in the PEQIS panel, for a sample of 1,612 institutions.[27] In October 1998, questionnaires (see appendix C) were mailed to the PEQIS coordinators at the institutions. Coordinators were told that the survey was designed to be completed by the person(s) at the institution most knowledgeable about the institution's distance education course offerings.

Eleven institutions were found to be out of the scope of the survey because they were closed, leaving 1,601 eligible institutions. These 1,601

[27] The number of institutions in the PEQIS panel decreased from 1,628 to 1,612 because of institutional closures and mergers.

institutions represent the universe of approximately 5,010 2-year and 4-year (including graduate-level) postsecondary education institutions in the 50 states and the District of Columbia. Telephone followup of nonrespondents was initiated in November 1998; data collection and clarification was completed in March 1999. For the eligible institutions that received surveys, an unweighted response rate of 93 percent (1,487 responding institutions divided by the 1,601 eligible institutions in the sample) was obtained. The weighted response rate for this survey was also 93 percent. The unweighted overall response rate was 93 percent (99.6 percent panel recruitment participation rate multiplied by the 92.9 percent survey response rate). The weighted overall response rate was 92 percent (99.7 percent weighted panel recruitment participation rate multiplied by the 92.7 percent weighted survey response rate).

Weighted item nonresponse rates ranged from 0 percent to 2.6 percent. Item nonresponse rates for most items were less than 1 percent. The items with the highest nonresponse rates involved the numbers of courses and enrollments. Because one of the major reasons for conducting this survey was to make national estimates for these numbers, imputation was implemented for all item nonresponse in the survey. The imputation procedures involved a combination of hot-deck imputation procedures for questions 2, 3, and 4, involving numbers of courses and enrollments, and the assignment of modal values from imputation classes for question 10, concerning plans for distance education technologies. These procedures are described in more detail below.

There were 33 institutions, which represent about 4.4 percent of the 753 responding institutions offering a distance education course, that did not report one or more data items in questions 2, 3, and 4. However, only a very few institutions did not report the numbers of different college-level, credit-granting courses offered by general fields of study in question 4. To impute the missing numbers of courses and enrollments, hot-deck imputation procedures were used. Hot-deck imputation selects a donor value from another institution with similar characteristics to use as the imputed value. The institutions were grouped to form imputation classes according to sector (public, private nonprofit, private for-profit), institutional level (4-year, 2-year) and enrollment size class. A donor institution was selected among the responding institutions within the imputation class. The donor institution was selected randomly, if the total number of credit granting courses and total enrollment were not reported. However, if these totals were reported, the institution with the closest totals to the recipient institution was selected as the donor. If enrollment was not reported but the number of courses offered was reported, enrollment for a specific field of study was imputed by multiplying the reported number of courses offered by the institution with the ratio of the total enrollment to the total number of courses offered for the field of study, computed using the responding institutions within the imputation class.

There were 29 institutions (or about 3 percent of the total number of institutions eligible for question 10) with missing data in one or more of the parts of question 10. The imputed items for question 10 had to be consistent with the corresponding reported data items in question 9. The institutions were grouped into imputation classes according to sector, institutional level, enrollment size class, and the reported value for question 9. The reported modal value among the responding institutions within the imputation class was assigned as the imputed value for the missing data item in question 10.

Sampling and Nonsampling Errors

The response data were weighted to produce national estimates (see table A). The weights were designed to adjust for the variable probabilities of selection and differential nonresponse. The findings in this report are estimates based on the sample selected and, consequently, are subject to sampling variability.

The survey estimates are also subject to nonsampling errors that can arise because of nonobservation (nonresponse or noncoverage) errors, errors of reporting, and errors made in data

collection. These errors can sometimes bias the data. Nonsampling errors may include such problems as misrecording of responses; incorrect editing, coding, and data entry; differences related to the particular time the survey was conducted; or errors in data preparation. While general sampling theory can be used in part to determine how to estimate the sampling variability of a statistic, nonsampling errors are not easy to measure and, for measurement purposes, usually require that an experiment be conducted as part of the data collection procedures or that data external to the study be used.

Table A.—Number and percentage distribution of postsecondary education institutions in the study, and the estimated number and percentage distribution in the nation, for the total sample and for institutions that offered distance education courses in 1997–98, by institutional characteristics: 1998–1999

Institutional characteristic	Total sample				Offered distance education in 1997–98			
	Respondents		National estimate*		Respondents		National estimate*	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All institutions	1,487	100	5,010	100	753	100	1,680	100
Institutional type								
Public 2-year	422	28	1,230	25	311	41	760	45
Private 2-year	206	14	1,120	22	15	2	60	3
Public 4-year	357	24	610	12	296	39	480	28
Private 4-year	502	34	2,050	41	131	17	390	23
Size of institution								
Less than 3,000	770	52	3,800	76	178	24	730	43
3,000 to 9,999	358	24	820	16	262	35	610	36
10,000 or more	359	24	400	8	313	42	350	21

*Data presented in all tables are weighted to produce national estimates. The sample was selected with probabilities proportionate to the square root of total enrollment. Institutions with larger enrollments have higher probabilities of inclusion and lower weights. The weighted numbers of institutions have been rounded to the nearest 10.

NOTE: Data are for postsecondary education institutions in the 50 states and the District of Columbia. Details may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

To minimize the potential for nonsampling errors, the questionnaire was pretested with respondents at institutions like those that completed the survey. During the design of the survey and the survey pretest, an effort was made to check for consistency of interpretation of questions and to eliminate ambiguous items. The questionnaire and instructions were extensively reviewed by the National Center for Education Statistics, U.S. Department of Education. Manual and machine editing of the questionnaire responses were conducted to check the data for accuracy and consistency. Cases with missing or inconsistent items were recontacted by telephone. Data were keyed with 100 percent verification.

Variances

The standard error is a measure of the variability of estimates due to sampling. It indicates the variability of a sample estimate that would be obtained from all possible samples of a given design and size. Standard errors are used as a measure of the precision expected from a particular sample. If all possible samples were surveyed under similar conditions, intervals of 1.96 standard errors below to 1.96 standard errors above a particular statistic would include the true population parameter being estimated in about 95 percent of the samples. This is a 95 percent confidence interval. For example, the estimated percentage of institutions reporting that they offered distance education courses in 1997–98 is 33.6 percent, and the estimated standard error is 1.0 percent. The 95 percent confidence interval for the statistic extends from [33.6 - (1.0 times 1.96)] to [33.6 + (1.0 times 1.96)], or from 31.6 to 35.6 percent. Tables of standard errors for each table and figure in the report are provided in appendix B.

Estimates of standard errors were computed using a technique known as jackknife replication. As with any replication method, jackknife replication involves constructing a number of subsamples (replicates) from the full sample and computing the statistic of interest for each replicate. The mean squared error of the replicate estimates around the full sample estimate provides an estimate of the variances of the statistics.[28] To construct the replications, 51 stratified subsamples of the full sample were created and then dropped one at a time to define 51 jackknife replicates.[29] A computer program (WesVarPC), distributed free of charge by Westat through the Internet,[30] was used to calculate the estimates of standard errors. WesVarPC is a stand-alone Windows application that computes sampling errors for a wide variety of statistics (totals, percents, ratios, log-odds ratios, general functions of estimates in tables, linear regression parameters, and logistic regression parameters).

The test statistics used in the analysis were calculated using the jackknife variances and thus appropriately reflected the complex nature of the sample design. In particular, an adjusted chi-square test using Satterthwaite's approximation to the design effect was used in the analysis of the two-way tables.[31] Finally, Bonferroni adjustments were made to control for multiple comparisons where appropriate. For example, for an "experiment-wise" comparison involving g pairwise comparisons, each difference was tested at the 0.05/g significance level to control for the fact that g differences were simultaneously tested.

Definitions of Analysis Variables

The following institutional characteristics were used as variables for analyzing the survey data:

- Type of institution: public 2-year, private 2-year, public 4-year, private 4-year. Type was created from a combination of level (2-year, 4-year) and control (public, private). Two-year institutions are defined as institutions at which the highest level of offering is at least

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[28] K. Wolter. *Introduction to Variance Estimation*. Springer-Verlag, 1985.

[29] Ibid, 183.

[30] WesVarPC version 2 is available through the Internet at http://www.westat.com/wesvar/.

[31] For example, see J.N.K. Rao and A. Scott, "On Chi-square Tests for Multi-way Contingency Tables with Cell Proportions Estimated from Survey Data," *Annals of Statistics* 12 (1984): 46-60.

2 but less than 4 years (below the baccalaureate degree); 4-year institutions are those at which the highest level of offering is 4 or more years (baccalaureate or higher degree).[32] Private comprises private nonprofit and private for-profit institutions; these private institutions are reported together because there are too few private for-profit institutions in the sample for this survey to report them as a separate category. Postsecondary education institutions include both institutions of higher education (traditional colleges and universities) and other postsecondary institutions (e.g., allied health and vocational-technical schools). Less-than-2-year institutions are not included in the PEQIS panel or in this survey.

- Size of institution: less than 3,000 students (small); 3,000 to 9,999 students (medium); and 10,000 or more students (large).

Comparing the PEQIS Studies: Technical Notes and Limitations

There are a number of factors that must be considered when comparing the 1995 and 1997–98 PEQIS studies. Differences in the samples and variations in question wording are discussed here. In addition, the data from the 1995 study were not imputed for item nonresponse. However, item nonresponse was very low and did not substantially affect the results. Item nonresponse is noted where it occurred when the data are presented in chapter 7.

Differences in the Samples

The two studies were sent to two somewhat different groups of institutions. The sample for the 1995 study consisted of all of the 2-year and 4-year higher education institutions in the PEQIS panel selected in 1991–92, which was based on the 1990–91 IPEDS "Institutional Characteristics" file. This sample of 1,274 institutions (of which 1,203 were respondents) represented the universe of approximately 3,460 higher education institutions at the 2-year and 4-year level in the 50 states, the District of Columbia, and Puerto Rico estimated to exist at the time of the survey. At the time the 1991–92 PEQIS panel was selected, NCES defined higher education institutions as institutions that are accredited at the college level by an agency recognized by the Secretary of the U.S. Department of Education.[33] Higher education institutions are a subset of all postsecondary education institutions. The 1995 study was sent only to higher education institutions in the PEQIS panel.

The sample for the 1997–98 study consisted of all of the 2-year and 4-year postsecondary education institutions in the PEQIS panel selected in 1996, which was based on the 1995–96 IPEDS "Institutional Characteristics" file. The 1996 PEQIS panel was selected in a way that maximized the overlap between the 1991–92 and 1996 panels. The 1,601 institutions in the 1997–98 study represented the universe of approximately 5,010 postsecondary education institutions at the 2-year and 4-year level in the 50 states and the District of Columbia estimated to exist at the time of the survey. At the time the 1996 PEQIS panel was selected, NCES was still defining higher education institutions in the same way as it was when the 1991–92 PEQIS panel was selected. The 1997–98 study was sent to all postsecondary education institutions in the PEQIS panel, both higher education and other postsecondary education institutions. In order to make comparisons between the two studies, the data from the 1997–98 study were analyzed for the subset of higher education institutions. These 1,347 institutions (of which 1,244 were respondents) represented the universe of

[32]Definitions for level are from the data file documentation for the Integrated Postsecondary Education Data System (IPEDS) "Institutional Characteristics" file, U.S. Department of Education, National Center for Education Statistics.

[33]NCES now defines higher education institutions as those institutions that are eligible for Title IV financial aid programs and that grant degrees (i.e., awarded at least one associate's or higher degree in the previous academic year). In 1997–98, there were 4,096 higher education institutions that met this revised definition, out of a universe of 9,632 postsecondary education institutions (U.S. Department of Education, National Center for Education Statistics, *Postsecondary Institutions in the United States: 1997–98*. Washington, DC: 1999).

approximately 3,580 higher education institutions at the 2-year and 4-year level in the 50 states and the District of Columbia estimated to exist at the time of the study. It is the data from this subset of institutions that are presented in the chapter on changes in distance education since 1994–95.

Variations in Question Wording

Number of distance education courses offered. In the 1995 study, institutions were asked for the total number of distance education courses with different catalog numbers offered by the institution in academic year 1994–95. Courses with different catalog numbers excluded multiple sections of the same course. In the 1997–98 study, institutions were asked to report the total number of different distance education courses (including courses for all levels and audiences), and the number of different college-level, credit-granting distance education courses offered at the institution in the 12-month 1997–98 academic year. If a course had multiple sections or was offered multiple times during the year, institutions were instructed to count it as only one course.

Enrollment in distance education courses. In 1995, institutions that offered any distance education courses were asked how many students were formally enrolled in the institution's distance education courses in academic year 1994–95. In the 1997–98 study, institutions that offered any distance education courses were asked about the total enrollment in all distance education courses in the 12-month 1997–98 academic year (including enrollments in courses designed for all levels and types of students, including elementary/secondary, adult education, etc.), and the enrollment in college-level, credit-granting distance education courses in 1997–98. In both studies, if a student was enrolled in multiple courses, institutions were instructed to count the student for each course in which he or she was enrolled. Thus, enrollments may include duplicated counts of students.

Degree and certificate programs. In 1995, institutions were asked whether students could complete degrees or certificates by taking distance education courses exclusively, and if so, how many different degrees or certificates could be received in this way. In the 1997–98 study, institutions were asked if they had any college-level degree or certificate programs based on credit-granting courses designed to be completed totally through distance education, and if so, how many such degree and certificate programs they had. In 1997–98, they were also instructed to include programs that may require a small amount of on-campus coursework or labwork, clinical work in hospitals, or similar arrangements, and to include baccalaureate degree completion programs.

Distance education technologies. In 1995, institutions were asked which types of technology they used to deliver their distance education courses. In 1997–98, institutions were asked which types of technology they used as a *primary* mode of instructional delivery for distance education courses. An individual course could only have one predominant mode of delivery. Institutions could, however, indicate that they used many different technologies as primary modes of instructional delivery across all of their distance education courses, since different distance education courses could use different types of technology. Information was not collected in either year about the number of courses offered using each technology, only whether the institution used it at all (or used it as a primary mode of instruction) for distance education courses.

The lists of technologies in the 2 years were similar but not identical. The incidence of audiographics was so low in 1995 that it was not included as a separate category in 1997–98. CD-ROM and multi-mode packages were added as categories in 1997–98. The wording of the computer-based technologies was changed to more accurately reflect how these technologies are used. In 1995, the categories were two-way online (computer-based) interactions during instruction, and other computer-based technology (e.g., Internet). In 1997–98, the categories were Internet courses using synchronous (i.e., simultaneous) computer-based instruction (e.g., interactive computer conferencing or Interactive Relay Chat), and Internet courses using

asynchronous (i.e., not simultaneous) computer-based instruction (e.g., e-mail, listserves, and most World Wide Web-based courses). For the comparisons presented in this report, two-way online (computer-based) interactions during instruction is compared to Internet courses using synchronous computer-based instruction, and other computer-based technology (e.g., Internet) is compared to Internet courses using asynchronous computer-based instruction.

Background Information

The survey was performed under contract with Westat, using the Postsecondary Education Quick Information System (PEQIS). This is the ninth PEQIS survey to be conducted. Westat's Project Director was Elizabeth Farris, and the Survey Manager was Laurie Lewis. Bernie Greene was the NCES Project Officer.

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Appendix B

Tables of Standard Errors

Table of Contents

Standard Error Tables for Text Tables and Figures

Table		Page
1a	Standard errors of the percentage distribution of 2-year and 4-year postsecondary education institutions in the nation, and the percentage distribution of students enrolled at those institutions, by institutional characteristics: 1997–98	B-7
2a	Standard errors of the number and percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education courses in 1997–98, that planned to offer them in the next 3 years, and that did not offer and did not plan to offer them in the next 3 years, by institutional characteristics	B-8
3a	Standard errors of the percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education courses in 1997–98, and the percentage distribution of students enrolled at those institutions, by institutional characteristics	B-9
4a	Standard errors of the total number of 2-year and 4-year postsecondary education institutions, and the number and percent of institutions in the nation that offered distance education courses in 1997–98, by level of institutional offerings	B-10
5a	Standard errors of the total number of enrollments in all distance education courses, and the number of enrollments in college-level, credit-granting distance education courses offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics	B-11
6a	Standard errors of the total number of different distance education courses, and the number of different college-level, credit-granting distance education courses offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics	B-12
7a	Standard errors of the percent of 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that offered college-level, credit-granting distance education courses in various fields of study in 1997–98, by course level and field	B-13
8a	Standard errors of the percent of all 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that offered college-level, credit-granting distance education courses in various fields of study in 1997–98, by institutional type and field	B-14
9a	Standard errors of the number of different college-level, credit-granting distance education courses offered in various fields by 2-year and 4-year postsecondary education institutions in 1997–98, by course level and field	B-15
10a	Standard errors of the number of different college-level, credit-granting distance education courses offered in various fields by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional type and field	B-16

Standard Error Tables for Text Tables and Figures (continued)

Table		Page
11a	Standard errors of the number of enrollments in college-level, credit-granting distance education courses offered in various fields at 2-year and 4-year postsecondary education institutions in 1997–98, by course level and field	B-17
12a	Standard errors of the number of enrollments in college-level, credit-granting distance education courses offered in various fields at 2-year and 4-year postsecondary education institutions in 1997–98, by institutional type and field	B-18
13a	Standard errors of the percent of all 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98, and the percent that had college-level degree or certificate programs designed to be completed totally through distance education in 1997–98, by institutional characteristics	B-19
14a	Standard errors of the percent of 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that had college-level degree or certificate programs in various fields that were designed to be completed totally through distance education, by level and field	B-20
15a	Standard errors of the number of college-level degree and certificate programs designed to be completed totally through distance education offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics	B-21
16a	Standard errors of the number of college-level degree programs in selected fields designed to be completed totally through distance education offered by 2-year and 4-year postsecondary education institutions in 1997–98, by level and field	B-22
17a	Standard errors of the percent of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 indicating that the institution used various types of technology as a primary mode of instructional delivery for distance education courses in 1997–98, by institutional characteristics	B-23
18a	Standard errors of the percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education in 1997–98 or that planned to offer distance education in the next 3 years according to their plans for the next 3 years concerning the number of distance education courses that will be offered, by type of technology that will be used as the primary mode of instructional delivery	B-24
19a	Standard errors of the percent of 2-year and 4-year postsecondary education institutions offering distance education in 1997–98 or planning to offer distance education in the next 3 years that planned to start or increase their use of various types of technologies as the primary mode of instructional delivery during the next 3 years	B-25

Table of Contents (continued)

Standard Error Tables for Text Tables and Figures (continued)

Table		Page
20a	Standard errors of the percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 according to how tuition charges for college-level, credit-granting courses offered through distance education compare to tuition charges for equivalent on-campus courses at their institution, by institutional characteristics	B-26
21a	Standard errors of the percentage distribution of 2-year and 4-year higher education institutions according to current or planned offering of distance education courses, by institutional characteristics: Fall 1995 and 1997–98	B-27
22a	Standard errors of the number of different distance education courses offered by 2-year and 4-year higher education institutions in 1994–95 and 1997–98, by institutional characteristics	B-28
23a	Standard errors of the number of enrollments in 1994–95 and 1997–98 in distance education courses offered by 2-year and 4-year higher education institutions, by institutional characteristics	B-29
24a	Standard errors of the percent of 2-year and 4-year higher education institutions offering distance education courses that offered distance education degree and certificate programs, and the number of such programs in 1995 and 1997–98	B-30
25a	Standard errors of the percent of 2-year and 4-year higher education institutions offering distance education courses that used various types of technologies to deliver distance education courses in 1995 and 1997–98	B-31
26a	Standard errors of the percent of 2-year and 4-year higher education institutions offering distance education courses that used selected types of technologies to deliver distance education courses in 1995 and 1997–98, by institutional type	B-32
27	Standard errors for the figures and for data not shown in tables	B-33

Table 1a.—Standard errors of the percentage distribution of 2-year and 4-year postsecondary education institutions in the nation, and the percentage distribution of students enrolled at those institutions, by institutional characteristics: 1997–98

Institutional characteristic	Institutions	Students
All institutions	(†)	(†)
Institutional type		
Public 2-year	0.6	0.3
Private 2-year	0.6	0.1
Public 4-year	0.2	0.3
Private 4-year	0.3	0.3
Size of institution		
Less than 3,000	0.3	0.2
3,000 to 9,999	0.2	0.3
10,000 or more*	0.1	0.2

* The estimated standard errors of the percentages of institutions and students are not zero for institutions with 10,000 or more students for these distributions because the base of the percentage is subject to sampling variability.

†Estimate of standard error is not derived because it is based on a statistic estimated at 100 percent.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 2a.—Standard errors of the number and percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education courses in 1997–98, that planned to offer them in the next 3 years, and that did not offer and did not plan to offer them in the next 3 years, by institutional characteristics

Institutional characteristic	Total number of institutions	Offered distance education in 1997–98		Planned to offer distance education in the next 3 years		Did not offer in 1997–98 and did not plan to offer in the next 3 years	
		Number	Percent	Number	Percent	Number	Percent
All institutions	41.9	44.5	1.0	77.3	1.5	77.2	1.4
Institutional type							
Public 2-year	31.9	24.8	2.5	22.5	1.7	29.6	2.1
Private 2-year	36.0	16.7	1.5	31.2	2.7	44.3	2.8
Public 4-year	8.9	11.5	1.8	9.2	1.5	9.3	1.5
Private 4-year	20.7	30.8	1.5	56.2	2.7	50.3	2.5
Size of institution							
Less than 3,000	42.5	42.6	1.2	76.7	2.0	76.4	1.7
3,000 to 9,999	8.3	13.4	1.5	10.2	1.3	11.4	1.4
10,000 or more*	0	0	0	0	0	0	0

*The estimated standard error is zero for institutions with 10,000 or more students, because all institutions of this size were included in the sample with certainty.

NOTE: Standard errors are computed on unrounded numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 3a.—Standard errors of the percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education courses in 1997–98, and the percentage distribution of students enrolled at those institutions, by institutional characteristics

Institutional characteristic	Institutions	Students
All institutions	(†)	(†)
Institutional type		
Public 2-year	1.2	0.4
Private 2-year	1.0	(††)
Public 4-year	0.9	0.4
Private 4-year	1.5	0.5
Size of institution		
Less than 3,000	1.5	0.5
3,000 to 9,999	1.1	0.6
10,000 or more*	0.5	0.5

*The estimated standard errors of the percentages of institutions and students are not zero for institutions with 10,000 or more students for these distributions because the base of the percentage is subject to sampling variability.

†Estimate of standard error is not derived because it is based on a statistic estimated at 100 percent.

††Standard error rounds to less than 0.1.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 4a.—Standard errors of the total number of 2-year and 4-year postsecondary education institutions, and the number and percent of institutions in the nation that offered distance education courses in 1997–98, by level of institutional offerings

Level of institutional offerings	Total number of institutions	Offered any distance education courses		Offered college-level, credit-granting distance education courses					
				Courses at either level		Undergraduate courses		Graduate/first-professional courses	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
All institutions	41.9	44.5	1.0	43.5	0.9	39.4	0.8	28.2	0.6
Institutions with undergraduate programs	57.2	44.1	1.1	42.3	1.0	38.7	1.0	25.5	0.6
Institutions with graduate/first-professional programs	44.4	28.1	1.5	27.6	1.5	20.8	1.1	28.0	1.5

NOTE: Standard errors are computed on unrounded numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 5a.—Standard errors of the total number of enrollments in all distance education courses, and the number of enrollments in college-level, credit-granting distance education courses offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics

Institutional characteristic	Total number of institutions	Number of institutions that offered distance education courses	Total number of enrollments in all distance education courses	Number of enrollments in college-level, credit-granting distance education courses		
				Enrollment in courses at both levels	Enrollments in undergraduate courses	Enrollments in graduate/ first-professional courses
All institutions	41.9	44.5	92,368.9	58,551.7	38,877.6	33,368.9
Institutional type[1]						
Public 2-year	31.9	24.8	33,659.8	33,463.4	33,477.3	—
Public 4-year	8.9	11.5	71,539.6	20,451.4	17,704.9	4,831.2
Private 4-year	20.7	30.8	33,498.3	32,993.2	10,340.2	31,202.4
Size of institution						
Less than 3,000	42.5	42.6	86,730.9	47,902.5	21,935.7	33,207.7
3,000 to 9,999	8.3	13.4	33,868.5	33,795.8	32,366.1	5,114.2
10,000 or more[2]	0	0	0	0	0	0

—Too few cases for a reliable estimate. Two-year branches of public 4-year institutions occasionally offer graduate/first-professional level courses.

[1]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

[2]The estimated standard error is zero for institutions with 10,000 or more students, because all institutions of this size were included in the sample with certainty.

NOTE: Standard errors are computed on unrounded numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 6a.—Standard errors of the total number of different distance education courses, and the number of different college-level, credit-granting distance education courses offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics

Institutional characteristic	Total number of institutions	Number of institutions that offered distance education courses	Total number of different distance education courses offered	Number of different college-level, credit-granting distance education courses offered		
				Courses at both levels	Undergraduate courses	Graduate/ first-professional courses
All institutions	41.9	44.5	2,311.9	2,049.4	1,793.0	685.0
Institutional type[1]						
Public 2-year	31.9	24.8	1,064.8	1,043.0	1,047.5	—
Public 4-year	8.9	11.5	1,433.2	1,097.5	947.2	223.7
Private 4-year	20.7	30.8	1,276.9	1,271.5	855.4	680.8
Size of institution						
Less than 3,000	42.5	42.6	2,079.4	1,781.3	1,574.3	621.5
3,000 to 9,999	8.3	13.4	1,021.2	1,007.3	873.4	243.7
10,000 or more[2]	0	0	0	0	0	0

—Too few cases for a reliable estimate. Two-year branches of public 4-year institutions occasionally offer graduate/first-professional level courses.

[1]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

[2]The estimated standard error is zero for institutions with 10,000 or more students, because institutions of this size were included in the sample with certainty.

NOTE: Standard errors are computed on unrounded numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 7a.—Standard errors of the percent of 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that offered college-level, credit-granting distance education courses in various fields of study in 1997–98, by course level and field

Field	Courses at either level	Undergraduate courses	Graduate/ first-professional courses
English, humanities, social and behavioral sciences	1.6	1.6	1.4
Business and management	1.7	1.7	1.9
Health professions	1.5	1.6	2.0
Physical and biological/life sciences	1.5	1.6	0.8
Mathematics	1.6	1.6	0.9
Education	1.3	1.2	2.1
Computer science	1.3	1.3	1.1
Vocational/technical fields	1.3	1.3	0.4
Engineering	0.8	0.7	1.0
Agriculture and natural resources	0.6	0.6	0.3
Library and information sciences	0.6	0.5	0.6
Other fields	1.5	1.2	2.3

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999

Table 8a.—Standard errors of the percent of all 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that offered college-level, credit-granting distance education courses in various fields of study in 1997–98, by institutional type and field

Field	All institutions	Institutional type*		
		Public 2-year	Public 4-year	Private 4-year
English, humanities, social and behavioral sciences	1.6	2.1	2.1	3.3
Business and management	1.7	2.8	2.3	3.7
Health professions	1.5	2.4	2.4	2.6
Physical and biological/life sciences	1.5	2.5	1.9	2.2
Mathematics	1.6	2.5	2.0	2.4
Education	1.3	1.8	2.4	3.2
Computer science	1.3	1.7	1.6	2.6
Vocational/technical fields	1.3	2.6	1.1	0.7
Engineering	0.8	1.2	1.5	1.5
Agriculture and natural resources	0.6	1.2	1.0	(†)
Library and information sciences	0.6	1.0	1.2	0.5
Other fields	1.5	1.2	1.1	5.1

*Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals.

†Estimate of standard error is not derived because it is based on a statistic estimated at 0 percent.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 9a.—Standard errors of the number of different college-level, credit-granting distance education courses offered in various fields by 2-year and 4-year postsecondary education institutions in 1997–98, by course level and field

Field	Courses at both levels	Undergraduate courses	Graduate/ first-professional courses
All fields	2,049.4	1,793.0	685.0
English, humanities, social and behavioral sciences	738.9	676.3	181.0
Business and management	421.7	390.0	202.5
Health professions	401.2	230.3	226.6
Physical and biological/life sciences	132.8	133.2	25.1
Mathematics	96.4	82.4	38.7
Education	236.1	112.0	221.8
Computer science	231.8	188.4	71.2
Vocational/technical fields	693.3	692.7	—
Engineering	199.3	113.0	126.6
Agriculture and natural resources	51.5	51.2	—
Library and information sciences	35.5	20.6	20.6
Other fields	401.2	726.3	359.6

—Too few cases for a reliable estimate.

NOTE: Standard errors are computed on unrounded numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 10a.—Standard errors of the number of different college-level, credit-granting distance education courses offered in various fields by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional type and field

Field	All institutions	Institutional type*		
		Public 2-year	Public 4-year	Private 4-year
All fields	2,049.4	1,043.0	1,097.5	1,271.5
English, humanities, social and behavioral sciences	738.9	442.2	468.4	289.9
Business and management	421.7	234.4	251.5	349.9
Health professions	401.2	139.8	18.4	251.2
Physical and biological/life sciences	132.8	78.5	97.7	—
Mathematics	96.4	47.7	53.3	—
Education	236.1	68.2	162.7	—
Computer science	231.8	85.2	36.7	—
Vocational/technical fields	693.3	694.6	39.5	—
Engineering	199.3	—	65.4	—
Agriculture and natural resources	51.5	—	37.7	—
Library and information sciences	35.5	—	21.2	—
Other fields	401.2	261.3	41.8	860.8

*Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals.

—Too few cases for a reliable estimate.

NOTE: Standard errors are computed on unrounded numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 11a.—Standard errors of the number of enrollments in college-level, credit-granting distance education courses offered in various fields at 2-year and 4-year postsecondary education institutions in 1997–98, by course level and field

Field	Enrollments in courses at both levels	Enrollments in undergraduate courses	Enrollments in graduate/ first-professional courses
All fields	58,551.7	38,877.6	33,368.9
English, humanities, social and behavioral sciences	23,494.8	22,175.4	6,207.0
Business and management	8,574.0	7,327.5	3,377.1
Health professions	6,759.6	5,090.5	3,456.6
Physical and biological/life sciences	6,329.2	6,409.5	415.4
Mathematics	2,193.6	2,150.6	204.2
Education	30,247.7	3,375.5	30,317.2
Computer science	6,341.0	4,893.4	2,107.0
Vocational/technical fields	8,129.9	8,095.3	—
Engineering	1,884.0	1,055.1	1,139.0
Agriculture and natural resources	2,495.0	2,499.2	—
Library and information sciences	1,697.8	1,602.0	472.3
Other fields	8,817.3	5,893.5	4,555.9

—Too few cases for a reliable estimate

NOTE: Standard errors are computed on unrounded numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999

Table 12a.—Standard errors of the number of enrollments in college-level, credit-granting distance education courses offered in various fields at 2-year and 4-year postsecondary education institutions in 1997–98, by institutional type and field

Field	All institutions	Institutional type*		
		Public 2-year	Public 4-year	Private 4-year
All fields	58,551.7	33,463.4	20,451.4	32,993.2
English, humanities, social and behavioral sciences	23,494.8	19,056.3	8,796.4	7,176.1
Business and management	8,574.0	4,678.5	5,678.1	5,903.3
Health professions	6,759.6	4,121.4	2,875.4	3,096.1
Physical and biological/life sciences	6,329.2	6,216.2	1,629.2	—
Mathematics	2,193.6	1,890.0	969.0	—
Education	30,247.7	2,713.8	3,287.7	—
Computer science	6,341.0	3,113.5	1,062.6	—
Vocational/technical fields	8,129.9	6,788.4	606.4	—
Engineering	1,884.0	—	944.9	—
Agriculture and natural resources	2,495.0	—	2,337.3	—
Library and information sciences	1,697.8	—	506.7	—
Other fields	8,817.3	4,349.1	539.5	5,570.3

*Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals.

—Too few cases for a reliable estimate.

NOTE: Standard errors are computed on unrounded numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System: Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 13a.—Standard errors of the percent of all 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98, and the percent that had college-level degree or certificate programs designed to be completed totally through distance education in 1997–98, by institutional characteristics

Institutional characteristic	Offered any distance education courses	Had any college-level degree or certificate programs		Degree programs			Certificate programs		
		All institutions	Institutions with distance education courses	Degree programs at either level	Undergraduate degree programs	Graduate/first-professional degree programs	Certificate programs at either level	Undergraduate certificate programs	Graduate/first-professional certificate programs
All institutions	1.0	1.0	1.2	1.0	1.0	1.9	0.9	0.5	1.3
Institutional type[1]									
Public 2-year	2.5	1.7	1.7	1.7	1.7	(†)	0.8	0.8	(†)
Public 4-year	1.8	2.0	2.1	2.0	1.4	2.1	0.9	0.4	0.9
Private 4-year	1.5	3.0	3.5	3.0	2.8	3.4	2.4	1.2	2.6
Size of institution									
Less than 3,000	1.2	2.1	2.6	2.1	2.1	4.7	1.9	1.1	3.3
3,000 to 9,999	1.5	1.6	1.6	1.6	1.5	2.1	0.8	0.8	1.2
10,000 or more[2]	0	0	0	0	0	0	0	0	0

†Not applicable for 2-year institutions.

[1]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

[2]The estimated standard error is zero for institutions with 10,000 or more students, because all institutions of this size were included in the sample with certainty.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 14a.—Standard errors of the percent of 2-year and 4-year postsecondary education institutions offering any distance education courses in 1997–98 that had college-level degree or certificate programs in various fields that were designed to be completed totally through distance education, by level and field

Field	Degree programs		Certificate programs	
	Undergraduate degree programs	Graduate/ first-professional degree programs	Undergraduate certificate programs	Graduate/ first-professional certificate programs
English, humanities, social and behavioral sciences	0.4	0.6	(††)	0.6
Business and management	0.5	1.2	0.2	0.7
Health professions	0.4	1.0	0.3	0.8
Physical and biological/life sciences	0.1	0.3	0.1	0.2
Mathematics	(†)	(††)	(†)	(††)
Education	0.3	1.1	0.2	0.2
Computer science	0.3	0.6	0.2	0.3
Vocational/technical fields	0.5	(††)	0.4	(†)
Engineering	0.3	0.6	(††)	0.3
Agriculture and natural resources	0.1	(††)	0.2	(††)
Library and information sciences	(†)	(††)	(††)	(††)
Liberal/general studies	0.6	(††)	(†)	(†)
Other fields	0.5	0.7	0.2	(†)

†Estimate of standard error is not derived because it is based on a statistic estimated at 0 percent.

††Standard error rounds to less than 0.1.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 15a.—Standard errors of the number of college-level degree and certificate programs designed to be completed totally through distance education offered by 2-year and 4-year postsecondary education institutions in 1997–98, by institutional characteristics

Institutional characteristic	Degree programs			Certificate programs		
	Degree programs at both levels	Undergraduate degree programs	Graduate/first-professional degree programs	Certificate programs at both levels	Undergraduate certificate programs	Graduate/first-professional certificate programs
All institutions	71.8	39.9	53.0	46.0	25.9	31.1
Institutional type[1]						
Public 2-year	23.3	23.3	(†)	—	—	(†)
Public 4-year	58.1	17.7	46.7	—	—	—
Private 4-year	53.6	36.0	0.0	—	—	—
Size of institution						
Less than 3,000	49.5	—	—	—	—	—
3,000 to 9,999	54.5	19.6	—	—	—	—
10,000 or more[2]	0	0	0	—	—	—

†Not applicable for 2-year institutions.

—Too few cases for a reliable estimate.

[1]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

[2]The estimated standard error is zero for institutions with 10,000 or more students, because all institutions of this size were included in the sample with certainty.

NOTE: Standard errors are computed on unrounded numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 16a.—Standard errors of the number of college-level degree programs in selected fields designed to be completed totally through distance education offered by 2-year and 4-year postsecondary education institutions in 1997–98, by level and field

Field	Undergraduate degree programs	Graduate/first-professional degree programs
Business and management	17.8	32.9
Health professions	—	16.2
Education	—	10.0
Engineering	—	14.5
Liberal/general studies	10.3	—

—Too few cases for a reliable estimate.

NOTE: Standard errors are computed on unrounded numbers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 17a.—Standard errors of the percent of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 indicating that the institution used various types of technology as a primary mode of instructional delivery for distance education courses in 1997–98, by institutional characteristics

Institutional characteristic	Two-way video with two-way audio (two-way interactive video)	One-way video with two-way audio	One-way live video	One-way pre-recorded video	Two-way audio transmission	One-way audio transmission	Internet courses using synchronous computer-based instruction	Internet courses using asynchronous computer-based instruction	CD-ROM	Multimode packages	Other technologies
All institutions	1.7	0.9	0.7	1.8	1.1	1.1	1.2	1.6	5.4	0.7	0.5
Institutional type[1]											
Public 2-year	3.1	1.9	1.1	2.7	1.2	0.7	1.7	2.3	1.2	1.2	0.4
Public 4-year	1.6	1.3	1.0	2.1	1.1	0.9	1.5	2.3	1.1	1.3	0.4
Private 4-year	3.8	0.9	(†)	4.5	3.8	4.1	3.1	4.3	1.2	1.2	0.4
Size of institution											
Less than 3,000	3.6	1.8	1.4	3.4	2.3	2.4	2.4	3.1	1.2	0.9	1.1
3,000 to 9,999	1.9	1.1	1.2	2.2	1.0	0.9	1.7	2.3	1.3	1.7	0.6
10,000 or more[2]	0	0	0	0	0	0	0	0	0	0	0

†Estimate of standard error is not derived because it is based on a statistic estimated at 0 percent.

[1]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

[2]The estimated standard error is zero for institutions with 10,000 or more students, because all institutions of this size were included in the sample with certainty.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 18a.—Standard errors of the percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education in 1997–98 or that planned to offer distance education in the next 3 years according to their plans for the next 3 years concerning the number of distance education courses that will be offered, by type of technology that will be used as the primary mode of instructional delivery

Technology	Reduce the number	Keep the same number	Start or increase the number	No plans to use the technology
Two-way video with two-way audio (two-way interactive video)	0.2	0.6	1.4	1.2
One-way video with two-way audio	0.1	0.3	1.6	1.6
One-way live video	0.3	0.2	0.9	1.0
One-way prerecorded video	0.1	0.9	1.6	1.5
Two-way audio transmission	0.2	0.6	0.8	1.0
One-way audio transmission	0.2	0.2	0.9	1.0
Internet courses using synchronous computer-based instruction	0.1	0.2	1.8	1.7
Internet courses using asynchronous computer-based instruction	(†)	0.3	1.5	1.5
CD-ROM	(†)	0.2	1.5	1.5
Multi-mode packages	0.1	0.2	1.2	1.3
Other technologies	0.1	0.1	0.5	0.5

†Estimate of standard error is not derived because it is based on a statistic estimated at 0 percent.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 19a.—Standard errors of the percent of 2-year and 4-year postsecondary education institutions offering distance education in 1997–98 or planning to offer distance education in the next 3 years that planned to start or increase their use of various types of technologies as the primary mode of instructional delivery during the next 3 years

Technology	Institutions that offered distance education in 1997–98	Institutions that planned to offer distance education in the next 3 years
Two-way video with two-way audio (two-way interactive video)	1.4	3.2
One-way video with two-way audio	1.2	3.4
One-way live video	0.8	2.4
One-way prerecorded video	1.5	2.6
Two-way audio transmission	0.9	1.7
One-way audio transmission	1.2	1.6
Internet courses using synchronous computer-based instruction	1.7	3.8
Internet courses using asynchronous computer-based instruction	1.3	3.4
CD-ROM	1.7	2.4
Multi-mode packages	1.4	2.2
Other technologies	0.6	1.0

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999

Table 20a.—Standard errors of the percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 according to how tuition charges for college-level, credit-granting courses offered through distance education compare to tuition charges for equivalent on-campus courses at their institution, by institutional characteristics

Institutional characteristic	Tuition charges are always higher for distance education courses than for on-campus courses	Tuition charges are always lower for distance education courses than for on-campus courses	Tuition charges are always the same for both distance education and on-campus courses	Tuition charges for distance education courses are sometimes the same as, and sometimes different than, tuition charges for on-campus courses
All institutions	0.8	0.6	1.3	1.1
Institutional type[1]				
Public 2-year	0.9	(†)	1.4	1.2
Public 4-year	1.0	0.5	2.1	2.0
Private 4-year	1.5	2.5	3.6	3.3
Size of institution				
Less than 3,000	1.7	1.3	2.7	2.2
3,000 to 9,999	1.1	0.5	1.6	1.7
10,000 or more[2]	0	0	0	0

†Estimate of standard error is not derived because it is based on a statistic estimated at 0 percent.

[1]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses in 1997–98 to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

[2]The estimated standard error is zero for institutions with 10,000 or more students, because all institutions of this size were included in the sample with certainty.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 21a.—Standard errors of the percentage distribution of 2-year and 4-year higher education institutions according to current or planned offering of distance education courses, by institutional characteristics: Fall 1995 and 1997–98

Institutional characteristic	Offered distance education		Planned to offer distance education in the next 3 years		Did not offer and did not plan to offer in the next 3 years	
	1995	1997–98	1995	1997–98	1995	1997–98
All institutions	1.0	1.1	1.6	1.6	1.6	1.5
Institutional type						
Public 2-year	1.9	2.4	2.1	2.1	1.7	1.8
Private 2-year	1.0	1.8	3.2	4.1	3.3	4.2
Public 4-year	2.0	1.9	2.2	1.5	2.2	1.5
Private 4-year	1.2	1.6	2.6	2.8	2.9	2.6
Size of institution						
Less than 3,000	1.2	1.6	2.3	2.4	2.2	2.1
3,000 to 9,999	2.0	1.5	1.8	1.2	1.2	1.3
10,000 or more*	0	0	0	0	0	0

*The estimated standard error is zero for institutions with 10,000 or more students, because all institutions of this size were included in the samples for both studies with certainty.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 22a.—Standard errors of the number of different distance education courses offered by 2-year and 4-year higher education institutions in 1994–95 and 1997–98, by institutional characteristics

Institutional characteristic	Total number of distance education courses with different catalog numbers offered in 1994–95	Total number of different distance education courses for any level or audience offered in 1997–98	Number of different college-level, credit-granting distance education courses offered in 1997–98
All institutions	1,553.8	1,987.9	1,693.9
Institutional type[1]			
Public 2-year	688.7	1,079.0	1,056.7
Public 4-year	631.7	1,433.2	1,097.5
Private 4-year	871.8	968.9	959.3
Size of institution			
Less than 3,000	1,414.7	1,726.3	1,375.3
3,000 to 9,999	663.2	1,019.3	1,005.4
10,000 or more[2]	0	0	0

[1]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

[2]The estimated standard error is zero for institutions with 10,000 or more students, because all institutions of this size were included in the samples for both studies with certainty.

NOTE: Standard errors are computed on unrounded numbers.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 23a.—Standard errors of the number of enrollments in 1994–95 and 1997–98 in distance education courses offered by 2-year and 4-year higher education institutions, by institutional characteristics

Institutional characteristic	Total number of formal enrollments in distance education courses in 1994–95	Total number of enrollments in all distance education courses in 1997–98	Total number of enrollments in college-level, credit-granting distance education courses in 1997–98
All institutions	30,045.7	90,438.2	57,947.8
Institutional type[1]			
Public 2-year	23,587.1	33,956.5	33,754.5
Public 4-year	13,559.1	71,539.6	20,451.4
Private 4-year	13,079.0	33,412.8	32,962.2
Size of institution			
Less than 3,000	21,339.5	83,950.5	47,096.2
3,000 to 9,999	22,337.5	33,946.2	33,873.7
10,000 or more[2]	0	0	0

[1]Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses to make reliable estimates. Data for private 2-year institutions are included in the totals and in analyses by other institutional characteristics.

[2]The estimated standard error is zero for institutions with 10,000 or more students, because all institutions of this size were included in the samples for both studies with certainty.

NOTE: Standard errors are computed on unrounded numbers.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 24a.—Standard errors of the percent of 2-year and 4-year higher education institutions offering distance education courses that offered distance education degree and certificate programs, and the number of such programs in 1995 and 1997–98

Type of program	Percent offering		Total number offered	
	1995	1997–98	1995	1997–98
Degree programs	1.7	0.9	70.3	70.9
Certificate programs	1.0	0.8	17.8	45.6

NOTE: Standard errors are computed on unrounded numbers.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 25a.—Standard errors of the percent of 2-year and 4-year higher education institutions offering distance education courses that used various types of technologies to deliver distance education courses in 1995 and 1997–98

Technology	1995	1997–98
Two-way video with two-way audio (two-way interactive video)	1.5	1.6
One-way video with two-way audio	1.3	0.9
One-way live video	0.9	0.6
One-way prerecorded video	1.6	1.7
Audiographics	0.4	(†)
Two-way audio transmission	1.3	0.8
One-way audio transmission	1.7	0.8
Internet courses using synchronous computer-based instruction	(†)	1.1
Internet courses using asynchronous computer-based instruction	(†)	1.6
Two-way online (computer-based) interactions during instruction	1.3	(†)
Other computer-based technology (e.g., Internet)	2.0	(†)
CD-ROM	(†)	0.6
Multi-mode packages	(†)	0.7
Other technologies	1.0	0.3

†Statistic not estimated for that year.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 26a.—Standard errors of the percent of 2-year and 4-year higher education institutions offering distance education courses that used selected types of technologies to deliver distance education courses in 1995 and 1997–98, by institutional type

Technology	1995			1997–98		
	Institutional type*			Institutional type*		
	Public 2-year	Public 4-year	Private 4-year	Public 2-year	Public 4-year	Private 4-year
Two-way video with two-way audio (two-way interactive video)	2.7	1.6	5.9	3.1	1.6	3.8
One-way video with two-way audio	2.2	2.0	5.8	1.7	1.3	0.8
One-way prerecorded video	2.7	2.1	5.3	2.7	2.1	3.6
Internet courses using synchronous computer-based instruction	(†)	(†)	(†)	1.8	1.5	3.2
Internet courses using asynchronous computer-based instruction	(†)	(†)	(†)	2.3	2.3	3.9
Two-way online (computer-based) interactions during instruction	1.1	1.4	6.6	(†)	(†)	(†)
Other computer-based technology (e.g., Internet)	2.2	2.0	6.8	(†)	(†)	(†)

†Statistic not estimated for that year.

*Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses to make reliable estimates.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education Courses Offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Table 27.—Standard errors for the figures and for data not shown in tables

Item	Estimate	Standard error
Figure 1: Percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 according to number of enrollments in distance education courses		
Enrollments in all courses		
1-80 enrollments	26	1.6
81-300 enrollments	26	1.8
301-800 enrollments	22	1.4
More than 800 enrollments	26	1.0
Enrollments in college-level, credit-granting courses		
0 enrollments	2	0.7
1-80 enrollments	26	1.6
81-300 enrollments	25	1.6
301-800 enrollments	22	1.4
More than 800 enrollments	25	1.0
Figure 2: Percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 according to number of distance education courses		
Total courses		
1-5 courses	23	1.6
6-15 courses	25	1.8
16-35 courses	28	1.3
More than 35 courses	24	1.3
College-level, credit-granting courses		
0 courses	2	0.7
1-5 courses	23	1.7
6-15 courses	26	2.0
16-35 courses	27	1.3
More than 35 courses	23	1.3
Figure 3: Percentage distribution of 2-year and 4-year postsecondary education institutions with variable charges for distance education courses compared with equivalent on-campus courses in 1997–98 indicating how those tuition charges for distance education courses differ		
Always higher	38	4.2
Always lower	14	5.1
Sometimes higher and sometimes lower	48	4.4
Figure 4: Percentage distribution of 2-year and 4-year postsecondary education institutions offering distance education courses in 1997–98 indicating whether the institution adds any special fees to college-level, credit-granting distance education courses that are not added to on-campus courses		
Always added	13	1.1
Sometimes added	21	1.3
Not added	66	1.7
Figure 5: Percentage distribution of 2-year and 4-year postsecondary education institutions with the same tuition for distance education and comparable on-campus courses in 1997–98, indicating whether the institution adds any special fees to college-level, credit-granting distance education courses that are not added to on-campus courses		
Always added	11	1.1
Sometimes added	15	1.5
Not added	74	1.9
Chapter 6, section on fees		
Percent of institutions charging both the same tuition and fees	57	1.7

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998–1999.

Appendix C

Survey Questionnaire

U.S. DEPARTMENT OF EDUCATION
NATIONAL CENTER FOR EDUCATION STATISTICS
WASHINGTON, D.C. 20208-5651

FORM APPROVED
O.M.B. No.: 1850-0733
EXPIRATION DATE: 07/1999

DISTANCE EDUCATION AT POSTSECONDARY EDUCATION INSTITUTIONS

POSTSECONDARY EDUCATION QUICK INFORMATION SYSTEM

This survey is authorized by law (P.L. 103-382). While participation in this survey is voluntary, your cooperation is critical to make the results of this survey comprehensive, accurate, and timely.

Definition of distance education for this survey refers to education or training courses delivered to remote (off-campus) location(s) via audio, video (live or prerecorded), or computer technologies, including both synchronous and asynchronous instruction. For purposes of this survey, courses conducted **exclusively** on campus are not included in this definition of distance education (although **some** on-campus instruction or testing may be involved); courses conducted **exclusively** via written correspondence are also not included (although **some** instruction may be conducted via written correspondence). Distance education also does **not** include courses in which the instructor travels to a remote site to deliver instruction in person. *Distance education courses may include a small amount of on-campus course or lab work, on-campus exams, or occasional on-campus meetings.*

The survey is designed to be completed by the person(s) most knowledgeable about your institution's distance education course offerings. Since we are interested in all such courses offered by your institution, we ask that you consult with your colleagues in other departments/offices that may also offer distance education courses.

IF ABOVE INSTITUTION INFORMATION IS INCORRECT, PLEASE UPDATE DIRECTLY ON LABEL.

Name of Person Completing This Form: _____

Title/Position: _____

Telephone Number: _____ E-mail: _____

THANK YOU. PLEASE KEEP A COPY OF THIS SURVEY FOR YOUR RECORDS.

PLEASE RETURN COMPLETED FORM TO:

Lewis (900442)
WESTAT
1650 Research Boulevard
Rockville, Maryland 20850

IF YOU HAVE ANY QUESTIONS, CONTACT:

Laurie Lewis at Westat
800-937-8281, Ext. 8284 or 301-251-8284
Fax: 800-254-0984
E-mail: lewisl1@westat.com

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 1850-0733. The time required to complete this information collection is estimated to average 30 minutes per response, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have any comments concerning the accuracy of the time estimate or suggestions for improving this form, please write to: U.S. Department of Education, Washington, DC 20202-4651. If you have any comments or concerns regarding the status of your individual submission of this form, write directly to: National Center for Education Statistics, 555 New Jersey Avenue, NW, Washington, DC 20208.

PEQIS Form No. 9, 10/1998

1. Did your institution offer any distance education courses (as defined on the front of this questionnaire) in 1997–1998 (12-month academic year), or plan to offer any such courses in the next 3 years? *(Circle only one number.)*

Yes, offered courses in 1997–1998 ..... 1 *(Continue with question 2.)*
Did not offer in 1997–1998, but plan to offer in next 3 years ..... 2 *(Skip to question 10.)*
No, did not offer in 1997–1998 and do not plan to offer in next 3 years ..... 3 *(Thank you. Please complete the respondent section on the front of the questionnaire and return it to Westat.)*

2. What was the **total** number of different distance education courses (including courses for all levels and audiences), and the number of different **college-level, credit-granting** distance education courses offered at your institution in 1997–1998 (12-month academic year)?

If a course had multiple sections or was offered multiple times during the academic year, count it as only one course. The total number of courses includes those designed for all types of students, including elementary/secondary, college, adult education, etc. College-level courses include both undergraduate and graduate/first-professional courses.

a. Total number of different distance education courses _____

b. Number of different college-level, credit-granting distance education courses _____

3. What was the **total** enrollment in **all** distance education courses, and the enrollment in **college-level, credit-granting** distance education courses at your institution in 1997–1998 (12-month academic year)?

Enrollments may include duplicated counts of students, i.e., a student should be counted for each course in which he/she was enrolled. The total includes enrollments in courses designed for all types of students. College-level courses include both undergraduate and graduate/first-professional courses.

a. Total number of enrollments in all distance education courses _____

b. Number of enrollments in college-level, credit-granting distance education courses _____

4. In the following general fields of study, indicate the number of different **college-level, credit-granting** courses offered through distance education at your institution in 1997–1998 (12-month academic year), and the number of enrollments in those courses.

If your institution did not offer any college-level, credit-granting distance education courses in a particular field in 1997–1998, enter 0. If a course had multiple sections or was offered multiple times during the academic year, count it as only one course. Please report separately for undergraduate and graduate/first-professional courses. Dual-level courses (i.e., courses that can be taken for either undergraduate or graduate credit) should be reported as undergraduate courses, and enrollments for these courses should be counted as undergraduate enrollments. Course enrollments may include duplicated counts, i.e., a student should be counted for each course in which he/she was enrolled.

NOTE: The sum of the number of undergraduate and graduate/first-professional courses across the fields of study (i.e., the sum of columns 1 and 3) should equal the number of courses given in question 2b. The sum of the number of undergraduate and graduate/first-professional enrollments across the fields of study (i.e., the sum of columns 2 and 4) should equal the number of enrollments given in question 3b.

Field	Undergraduate		Graduate/first-professional	
	1. Number of courses	2. Number of enrollments	3. Number of courses	4. Number of enrollments
a. Agriculture and natural resources				
b. Business and management				
c. Education				
d. Engineering				
e. Mathematics				
f. Computer science				
g. Physical and biological/life sciences				
h. English, humanities, social/behavioral sciences				
i. Library and information sciences				
j. Health professions				
k. Vocational/technical fields				
l. Other fields *(specify)*				

5. In academic year 1997–1998, did your institution have any college-level degree or certificate programs designed to be completed totally through distance education? *(Include only degree or certificate programs that are based on credit-granting courses; include programs that may require a small amount of on-campus course or lab work, clinical work in hospitals, or similar arrangements, and baccalaureate degree completion programs.)*

Yes ..... 1 *(Continue with question 6.)* No ..... 2 *(Skip to question 7.)*

6. How many different college-level degree or certificate programs designed to be completed totally through distance education did your institution offer in 1997–1998 (12-month academic year)? *(Include only degree or certificate programs that are based on credit-granting courses; include programs that may require a small amount of on-campus course or lab work, clinical work in hospitals, or similar arrangements, and baccalaureate degree completion programs.)*

Please report separately for undergraduate and graduate/first-professional programs, and for degree and certificate programs. Report the total number of programs, and then provide a breakout of the total by field of study.

Distance education degree and certificate programs	Undergraduate		Graduate/first-professional	
	Degree	Certificate	Degree	Certificate
A. Total number of distance education degree and certificate programs based on **credit-granting** courses				
B. **Field of study for credit-based degree and certificate programs:** *(Sum of a through m below must equal the totals given on line A.)*				
a. Agriculture and natural resources				
b. Business and management				
c. Education				
d. Engineering				
e. Mathematics				
f. Computer science				
g. Physical and biological/life sciences				
h. English, humanities, social and behavioral sciences				
i. Library and information sciences				
j. Health professions				
k. Vocational/technical fields				
l. Liberal/general studies				
m. Other *(specify)*				

7. How do the tuition charges for college-level, credit-granting courses offered through distance education at your institution compare to tuition charges for equivalent on-campus courses? *(Circle only one number.)*

Tuition charges are always higher for distance education courses than for on-campus courses .. 1
Tuition charges are always lower for distance education courses than for on-campus courses.... 2
Tuition charges are always the same for both distance education and on-campus courses..... 3
Tuition charges for distance education courses are sometimes the same as, and sometimes different than, tuition charges for on-campus courses 4

When different, the tuition charges for distance education courses are: *(Circle only one number.)*

Always higher than for on-campus courses 1
Always lower than for on-campus courses..... 2
Sometimes higher and sometimes lower than for on-campus courses ... 3

8. Does your institution add any special fees to college-level, credit-granting distance education courses (e.g., fees that depend on delivery format or location) that are not added to on-campus courses? *(Circle only one number.)*

Yes, special fees are always added..... 1
Yes, special fees are sometimes added 2
No, special fees are not added..... 3

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9. Which types of technology did your institution use as a **primary** mode of instructional delivery for distance education courses in 1997–1998 (12-month academic year)? *Circle all the technologies that any distance education course used as a primary mode of delivery. If a course used multiple technologies to deliver instruction, but one mode predominated, circle the predominant mode for the course.*

a.	Two-way video with two-way audio (i.e., two-way interactive video)	1
b.	One-way video with two-way audio	2
c.	One-way live video	3
d.	One-way prerecorded video (including prerecorded videotapes provided to students, and television broadcast and cable transmission using prerecorded video)	4
e.	Two-way audio transmission (e.g., audio/phone conferencing)	5
f.	One-way audio transmission (including radio broadcast and prerecorded audiotapes provided to students)	6
g.	Internet courses using synchronous (i.e., simultaneous or "real time") computer-based instruction (e.g., interactive computer conferencing or Interactive Relay Chat)	7
h.	Internet courses using asynchronous (i.e., not simultaneous) computer-based instruction (e.g., e-mail, listservs, and most World Wide Web-based courses)	8
i.	CD-ROM	9
j.	Multi-mode packages (i.e., a mix of technologies that cannot be assigned to a primary mode)	10
	(specify technologies used) _____	
k.	Other technologies *(specify)* _____	11

10. In the next 3 years, what are your institution's **plans** concerning the number of distance education courses that will be offered using the following technologies as the **primary** mode of instructional delivery? *If a course will use multiple technologies to deliver instruction, but one mode will predominate, consider the course under the predominant mode. (Circle one number on each line.)*

		Reduce	Keep same number	Start or increase	No plans
a.	Two-way video with two-way audio (i.e., two-way interactive video)	1	2	3	4
b.	One-way video with two-way audio	1	2	3	4
c.	One-way live video	1	2	3	4
d.	One-way prerecorded video (including prerecorded videotapes provided to students, and television broadcast and cable transmission using prerecorded video)	1	2	3	4
e.	Two-way audio transmission (e.g., audio/phone conferencing)	1	2	3	4
f.	One-way audio transmission (including radio broadcast and prerecorded audiotapes provided to students)	1	2	3	4
g.	Internet courses using synchronous (i.e., simultaneous or "real time") computer-based instruction (e.g., interactive computer conferencing or Interactive Relay Chat)	1	2	3	4
h.	Internet courses using asynchronous (i.e., not simultaneous) computer-based instruction (e.g., e-mail, listservs, and most World Wide Web-based courses)	1	2	3	4
i.	CD-ROM	1	2	3	4
j.	Multi-mode packages (i.e., a mix of technologies that cannot be assigned to a primary mode)	1	2	3	4
	*(specify technologies to be used)*_____				
k.	Other technologies *(specify)* _____	1	2	3	4

Thank you. Please keep a copy for your records.

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